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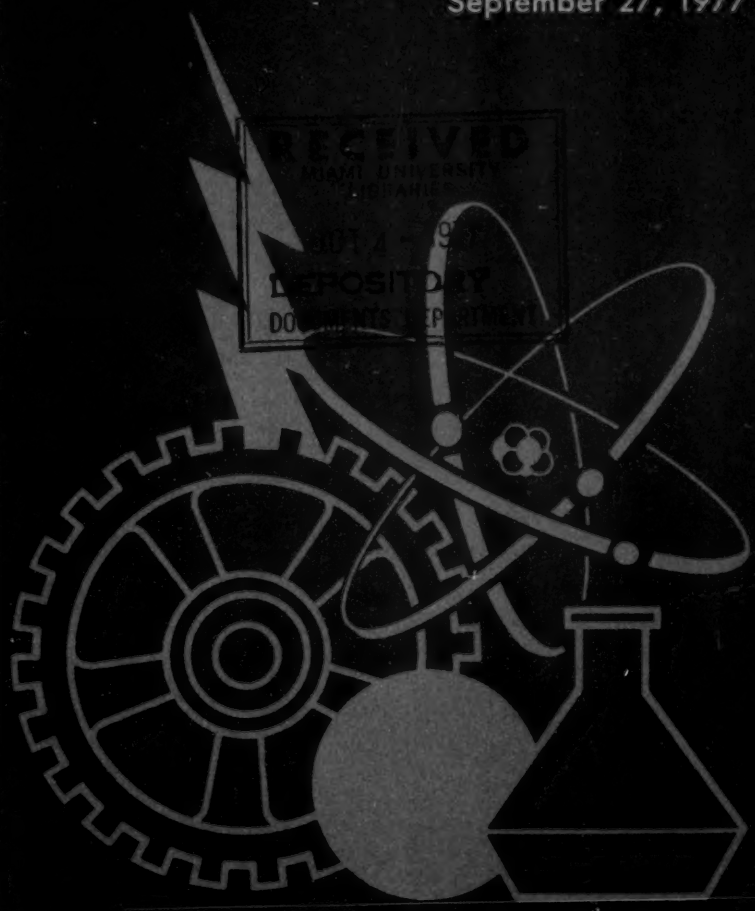
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

September 27, 1977



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September 27, 1977 Volume 962 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

Sets of Addenda to the Classification Definitions

The definitions of the classes listed below were modified by addenda as part of Classification Orders 500 to 581, issued between January 1, 1976 and March 31, 1977. The availability of these Classification Orders has been announced in the Official Gazette from time to time. However, these notices do not identify the definitions being modified by addenda. Classification definitions furnished to the public have and will continue to include the addenda from issued Classification Orders.

All of these addenda have been consolidated into three sets of "Addenda to the Classification Definitions." Future addenda sets will be prepared and announced quarterly.

Addenda		Addenda		Addenda	
Class	Set No.(s)	Class	Set No.(s)	Class	Set No.(s)
2	I; II	122	I	256	II
4	II	123	II; III	258	II
5	I	124	I	259	II
7	II	126	I	260	I; II
8	I; II	127	II	264	I; II; III
9	I; II	128	II; III	266	II
10	II; III	131	I; II	269	II; III
12	II; III	134	I; II	271	II
13	I; II	135	I; II	272	I; II
14	II	136	II; III	273	I
15	II; III	137	II; III	277	II
16	II	138	III	280	I; II
19	II	139	I; III	285	III
21	II	140	I; III	290	III
23	I; II	141	II	293	I; III
24	I; II	144	III	294	II; III
26	I	147	III	296	I; II
27	I	148	I; II; III	297	I; II
28	I	150		298	I
29	II; III	152	III	299	II
30	II	156	I; II; III	302	I; II
33	I; III	157	III	303	II
34	I; II	160	II	305	II
35	I; II	162	II	307	II; III
36	I; III	164	I,II	308	III
37	II	165	I; III	310	II; III
38	I	166	II	312	II
40	I; III	171	II	313	I; II; III
42	I	172	I; II	314	III
43	I; II	173	III	315	II; III
46	I	174	I; II; III	316	I; III
47	I; II	175	II	317	II; III
48	I	176	II; III	318	I; II; III
49	I; II; III	177	II	320	II; III
51	I; II	178	I; II; III	321	II
52	II; III	179	I; II; III	322	II; III
53	II; III	180	I; II; III	323	II; III
54	II	182	II	324	II; III
55	III	184	II	325	II; III
56	II	186	II	328	II; III
57	III	187	II; III	329	II; III
58	III	192	II	330	II; III
59	III	193	I; II	331	II; III
60	II; III	198	I; II	332	II; III
61	II	200	III	333	II; III
62	II	201	I; II; III	334	II; III
65	I; III	202	I; II; III	335	II; III
66	II	203	I; III	336	I; II; III
68	I	204	II; III	337	III
69	I	206	II; III	339	II; III
70	II	208	I	340	I; II; III
71	II	209	I; II; III	343	I; II; III
72	II; III	210	I; II; III	346	II; III
73	I; II; III	211	I; II	350	II; III
74	II; III	212	II	351	II
75	I	214	I; II; III	352	II; III
81	I; II; III	215	I	353	II
83	I; II	219	I; II; III	354	II; III
84	II	220	I; II	355	II; III
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106	I; II; III	241	I; II	424	II
108	II	242	I; II; III	425	I; II; III
109	III	243	I	426	II
110	I; II	244	I; II	427	I; II; III
111	II	245	II	428	I; II
112	II	246	III	429	II
113	III	248	I; II	431	I; II; III
114	I; II	249	II; III	432	I; II
115	II; III	250	I; II; III	520+	II
116	I; II	251	II; III	530+	II
118	I; II; III	252	I; II; III		
119	II; III	254	I; II; III		

Aug. 19, 1977.

ALFRED C. MARMOR,
Administrator for Documentation.

Certificate of Mailing Procedures

On November 1, 1976, the Patent and Trademark Office instituted the Certificate of Mailing Procedure by promulgating 37 CFR 1.8 in an attempt to reduce the number of problems resulting from late receipt of responses due to mail delays. This notice was published in the OFFICIAL GAZETTE on October 26, 1976 (951 O.G. 1342 and TM 210). Guidelines relative to this procedure were published in the OFFICIAL GAZETTE on November 16, 1976 (952 O.G. 918 and TM 174).

Although the new procedure has gained wide acceptance, it has not been entirely without problems. One major problem involves the correlation of the certification with the appropriate papers when presented on a separate sheet. In order to curtail this problem and other minor ones, the guidelines published on November 16, 1976, are superseded by the following guidelines. They are applicable to responses in both patent and trademark matters, as permitted by 37 CFR 1.8.

Guidelines

A) The certification requires a signature. Specifically, if the certification appears on a paper that requires a signature, two signatures are required, one for the paper and one for the certification. Although not specifically required by 37 CFR 1.8, it is preferred that the certificate be signed by the applicant, assignee, or registered practitioner.

B) When possible, the certification should appear on a portion of the paper being submitted. However, if there is insufficient space to make the certification on the same paper, such as in the case of the patent issue fee transmittal form PTO–85, the certification should be on a separate sheet securely attached to the paper.

C) When the certification is presented on a separate sheet, that sheet must (1) be signed and (2) fully identify and be securely attached to the paper it accompanies. The required identification should include the serial number and filing date of the application as well as the type of paper being filed, e.g., response to rejection or refusal, Notice of Appeal, etc. An unsigned certification will not be considered acceptable.

Moreover, without the proper identifying data, a certification presented on a separate sheet will not be considered acceptable if there is any question or doubt concerning the connection between the sheet and the paper filed.

If the sheet should become detached from the paper and thereafter not associated with the appropriate file, evidence that this sheet was received in the Office can be supported by submitting a copy of a post card receipt specifically identifying this sheet and the paper and by submitting a copy of the sheet as originally mailed. Attention is directed to the notice of November 21, 1968 published in the OFFICIAL GAZETTE (857 O.G. 667) relative to the use of post cards as receipts.

D) In situations wherein the correspondence includes papers for more than one application (e.g., a single envelope containing separate papers responding to Office actions in different applications) or papers for various parts of the Office (e.g., a patent issue fee transmittal form PTO–85 and an assignment), each paper must have its own certification as a part thereof or attached thereto.

E) In situations wherein the correspondence includes several papers directed to the same application (e.g., a proposed response under 37 CFR 1.116 and a Notice of Appeal), each paper should have its own certification as a part thereof or attached thereto.

Use of Stamped Certification

Some practitioners are placing the certification language on the first page of a paper with an inked stamp. Such a practice is encouraged because the certification is not only

readily visible but also forms an integral part of the paper. An example of a preferred stamp is :

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to : Commissioner of Patents and Trademarks, Washington, D.C. 20231, on ----------.

(Date of Deposit)

Name of applicant, assignee, or Registered Representative

Signature

Date of Signature

Interpretations

The phrase "prior to expiration of the set period" in 37 CFR 1.8(a) includes the last day of the set period, which last day may be the "next succeeding secular or business day" as set out in 35 U.S.C. 21. Also, the filing of a 37 CFR 3.54 form to effect a filing under 37 CFR 1.60 is considered the filing of an application is, therefore, excluded from the Certificate of Mailing procedure.

C. MARSHALL DANN,
Aug. 30, 1977. *Commissioner of Patent and Trademarks.*

New Procedures for Recordation of Interviews

This notice establishes within the Patent and Trademark Office additional general procedures for the recordation of interviews. Proposed procedures were published in the OFFICIAL GAZETTE of June 28, 1977 (959 O.G. 36) for comment from interested members of the public by August 10, 1977. Fifteen written comments were received the majority of which were favorable to the proposed procedures. Careful consideration has been given to the comments and the procedures are being adopted with a few changes.

Under present practice it is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability as set forth in Section 713.04 of the Manual of Patent Examining Procedure (MPEP). This practice is continued and further amplified as set forth below.

Recent surveys have indicated that the substance of many interviews has not been made of record or the text thereof is incomplete as to substantive matters. In some cases, the substance of an interview may be presented as arguments in a subsequent response filed by the applicant but without any indication that they had been presented at the interview. In order to help insure a better record of examiner-applicant interviews in application files, the following new procedures are adopted to become effective for interviews conducted on and after January 1, 1978. Appropriate changes will be made in the Manual of Patent Examining Procedure (MPEP).

Examiners will complete a two-sheet carbon interleaf Interview Summary Form for each interview held where a matter of substance has been discussed by checking the appropriate boxes and filling in the blanks in neat handwritten form. Discussions regarding only procedural matters, directed solely to restriction requirements (for which interview recordation is othewise provided for in Section 812.01 of the MPEP), or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below.

The Interview Summary Form shall be given an appropriate paper number, placed in the file, and listed on the "Contents" list on the file wrapper. The docket and serial register cards will not be updated to reflect this interview. In a personal interview, the duplicate copy of the Form will be removed and given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephonic interview, the copy will be mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner before an allowance is not likely or if other circumstances dictate, the Form will be mailed promptly after the telephonic interview rather than with the next official communication. The original of the completed Form will be made of record and placed in the right hand flap of the file.

The Form provides for recordation of the following information :

— Serial Number of the application
— Name of applicant
— Name of examiner
— Date of interview
— Type of interview (personal or telephonic)
— Name of participant(s) (applicant, attorney or agent, etc.)
— An indication whether or not an exhibit was shown or a demonstration conducted
— An identification of the claims discussed
— An identification of the specific prior art discussed
— An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). (Agreements as to allowability are tentative and do not restrict further action by the examiner to the contrary.)
— The signature of the examiner who conducted the interview
— Names of other Patent and Trademark Office personnel present.

The Form also contains a statement reminding the applicant of his responsibility to record the substance of the interview.

It is desirable that the examiner orally remind the applicant of his obligation to record the substance of the interview in each case unless both applicant and examiner agree that the examiner will record same. Where the examiner agrees to record the substance of the interview, or when it is adequately recorded on the Form or in an attachment to the Form, the examiner will check a box at the bottom of the Form informing the applicant that he need not supplement the Form by submitting a separate record of the substance of the interview.

It should be noted, however, that the Interview Summary Form will not be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview :

The complete and proper recordation of the substance of any interview should include at least the following applicable items :

1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner. The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he feels were or might be persuasive to the examiner,
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete or accurate, the examiner will take appropriate action as set forth in MPEP Section 713.04. If the record is complete and accurate, the examiner should place the indication "Interview record OK" on the paper recording the substance of the interview along wtih the date and the examiner's initials.

C. MARSHALL DANN,
Aug. 30, 1977. *Commissioner of Patents and Trademarks.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

3,055,988, B. B. Bauer, MAGNETIC PHONOGRAPH PICKUP; **3,077,521,** Ahrens, Kuhn and Richter, STEREOPHONIC MOVING MAGNET PHONOGRAPH PICKUP; **3,077,522,** Gunter, Jr. and Anderson, STEREOPHONIC PICKUP CARTRIDGE, **filed** May 6, 1977, D.C., N.D. Ill. (Chicago) Doc. 77c1609, *Shure Brothers, Inc.* v. *Korvettes, Inc.*

3,077,521. (See 3,055,988.)

3,077,522. (See 3,055,988.)

3,214,510, R. W. Harmon, CORONA REDUCTION IN CONDUCTOR CLAMPS FOR HIGH VOLTAGE TRANSMISSION LINES, **filed** May 11, 1977, D.C., N.D. Ill. (Chicago) Doc. 77c1681, *Bunker Ramo Corp.* v. *Western Electric Company, Inc.*

3,442,692, C. J. Gaiser, METHOD OF CONDITIONING FABRICS; **3,944,694,** A. R. McQueary, ARTICLE FOR CONDITIONING FABRICS IN A CLOTHES DRYER, **filed** May 16, 1977, D.C., N.D. Ohio (Toledo) Doc. C77–229, *The Procter & Gamble Company* v. *Hunt Chemicals, Inc.*

3,487,221, L. M. Frank, LIGHT ACTIVATED TRIGGER FOR PHOTOGRAPHIC FLASH SYSTEM, **filed** May 24, 1976, D.C., N.D. Ill. (Chicago) Doc. 76c1928, *The Lase Co.* v. *Lawrence L. Goldberg, doing business as Lenmar Enterprises.* Defendant has infringed said patent, motion for entry of judgment order on consent is granted, Nov. 23, 1976.

3,537,091, G. E. Schenkgenberg, SEED MONITORING SYSTEM; **3,723,989,** G. H. Fathauer, ELECTRONIC PLANTER MONITOR; **3,928,751,** same, SEED POPULATION MONITOR; **3,974,377,** D. E. Steffen, SOLID STATE SEED SENSOR; **4,009,799,** same, MONITOR FOR SEED PLANTING APPARATUS, **filed** May 11, 1977, D.C., N.D. Ill. (Chicago) Doc. 77c1680, *Dickey-John Corporation* v. *Richway Sales et al.*

3,568,924, L. H. Chenault, SNOW MELTING SYSTEM, **filed** June 9, 1976, D.C., E.D. Wis. (Milwaukee), Doc. 76–401, *Hume Snow Melting Systems, Inc. and Lawrence H. Chenault* v. *Grunau Company, Inc.* Dismissed by stipulation and order on May 12, 1977.

3,700,796, D. E. Griffey, D-C COUPLED SYNC CLIPPING VIDEO AMPLIFIER, **filed** Apr. 9, 1976, D.C. Del. (Wilmington), Doc. 76–138, *Mobil Oil Corporation* v. *E. I. du Pont de Nemours & Co., Inc.* Stipulation and order dismissing this action without prejudice, May 13, 1977.

3,723,989. (See 3,537,091.)

3,731,434, G. E. Korwinski, GRINDING MACHINE; **3,736,113,** Umbdenstock and Breitenstein, SPIRAL GRINDING RELIEVING MACHINE WITH TANDEM PLANETARY DIFFERENTIAL DRIVE, **filed** Oct. 24, 1973, D.C., N.D. Ill. (Chicago) Doc. 73c2731, *Spiral Step Stool Co.* v. *Metal Removal Div. Fed. Mogul Corp. et al.* Case closed October 1975, order not available.

3,733,657, G. B. Lankton, ASSEMBLY OF ATTACHMENTS AND METHOD OF MANIPULATING THE SAME, **filed** Mar. 22, 1977, D.C., N.D. Ill. (Chicago) Doc. 77c951, *Dennison Mfg. Co.* v. *Tamp Corp.* Defendant is enjoined and restrained from making, using or selling any and all products covered by said patent. Defendant shall deliver to plaintiff all aforesaid infringing products now in its possession. Agreed order entered, May 12, 1977.

3,736,113. (See 3,731,434.)

3,772,132, G. N. Dulin, Jr., FLOCKED FABRIC AND METHOD FOR MAKING SAME, **filed** May 17, 1977, D.C., S.D.N.Y., Doc. 77–C–2434, *Madden Hills Inc.* v. *Flock Industries, Inc.*

3,826,068, Ballas and Geist, ROTARY CUTTING ASSEMBLY; **3,859,776,** same, **filed** May 6, 1977, D.C., S.D. Calif. (Los Angeles) Doc. CV77–1651–RJK, *Weed Eater, Inc.* v. *The Toro Company.*

3,859,776. (See 3,826,068.)

3,881,915, S. Proler, METHOD FOR ENHANCING REDUCTION OF ORES, OXIDES AND MELTING OF METALS BY MAGNETIC FORCES, **filed** May 6, 1977, D.C., E.D. Wis. (Milwaukee) Doc. 77–268, *Sam Proler* v. *Modern Equipment Company.*

3,905,349, Nielsen and Church, INDUCED AIR DEVICE FOR DISCHARGING SPHERICAL MEMBERS, **filed** May 13, 1977, D.C.N.J. (Newark) Doc. 77–0938, *Prince Manufacturing, Inc.* v. *Lob-ster, Inc. and Harry A. Giuditta.*

3,910,728, A. H. Sloan, DEWATERING PUMP APPARATUS; **3,957,402,** same, DEWATERING PUMP ASSEMBLY HAVING A HEAT EXCHANGER; **3,957,403,** same, DEWATERING PUMP ASSEMBLY, **filed** May 9, 1977, D.C., M.D. Fla. (Tampa) Doc. 77–22–C Ft.M.H., *Albert H. Sloan* v. *Mack Pump Co., Ronald F. Cox and Charles B. Cunningham.*

3,928,751. (See 3,537,091.)

3,939,815, D. K. Spivey, ENGINE STARTER AND BRACKET, **filed** May 2, 1977, D.C., S.D. Fla. (Fort Lauderdale) Doc. 77–1439–C–NCR, *Donald K. Spivey and Stefan M. Stein* v. *Power Lawnmower Parts, Inc. and Lee Rosenbaum.*

3,944,694. (See 3,442,692.)

3,957,402. (See 3,910,728.)

3,957,403. (See 3,910,728.)

3,968,256, E. L. Sing, PREPARATION OF COTTAGE CHEESE, **filed** Apr. 4, 1977, D.C., E.D. Mo. (St. Louis) Doc. 77–360C(4), *Edmond L. Sing* v. *Culture Products, Inc. and James G. Wright.*

3,972,207, J. Vinas, SELECTION DEVICE FOR THE NEEDLES OF A KNITTING MACHINE, **filed** May 18, 1977, D.C., S.D.N.Y., Doc. 77–C–2454, *Vinatex Knitting Systems, Inc.* v. *Jumberca (U.S.A.) Inc. et al.*

3,974,377. (See 3,537,091.)

4,009,799. (See 3,537,091.)

Re. 25,338, D. L. Olson, PRESSURE-OPERATED VALVE WITH MAGNETICALLY ACTUATED PILOT, **filed** May 12, 1977, D.C.N.J. (Newark) Doc. 77–0912, *Marotta Scientific Controls, Inc.* v. *Valcor Engineering Corp.*

Re. 25,536, D. T. Thompson, APPARATUS FOR MAKING AN ANNULUS, **filed** Sept. 28, 1976, D.C. Conn. (New Haven) Doc. N 76–329, *Thompson Bagel Machine Manufacturing Corporation* v. *Lender's Bagel Bakery, Inc.* Stipulated judgment entered that plaintiff is the exclusive licensee of said reissue and that the "Lugo" bagel machine manufactured and used by defendant is an infringement of claims 5, 7 and 12 of said reissue, Apr. 26, 1977.

D. 243,330, K. Pichler, EYEGLASS FRAME, **filed** Apr. 22, 1977, D.C., E.D.N.Y. (Brooklyn) Doc. 77C844, *Optyl Corporation* v. *Swan Optical Corporation.* **Same, filed** Apr. 22, 1977, D.C., E.D.N.Y. (Brooklyn) Doc. 77C845, *Optyl Corporation* v. *Styl-Rite Optics, Inc.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,253,921, Re. S.N. 818,696, Filed July 25, 1977, Cl. 96/73, NOVEL PHOTOGRAPHIC ELEMENTS PROTECTED AGAINST ULTRAVIOLET RADIATION, George W. Sawdey, Owner of Record: *Eastman Kodak Company, Rochester, N.Y.,* Attorney or Agent: Joshua G. Levitt, et al., Ex. Gp.: 166

3,727,059, Re. S.N. 820,228, Filed July 29, 1977, Cl. 250/108 R, CONTAINER FOR TRANSPORTING RADIOACTIVE MATERIALS, Stanton L. Reese, Owner of Record: *Inventor,* Attorney or Agent: Martin Fleit, et al., Ex. Gp.: 256

3,764,970, Re. S.N. 820,187, Filed July 29, 1977, Cl. 340/18 NC, WELL BORE DATA-TRANSMISSION APPARATUS WITH DEBRIS CLEARING APPARATUS, Kenneth G. Manning, Owner of Record: *Schlumberger Technology Corporation, New York, N.Y.,* Attorney or Agent: David L. Moseley, et al., Ex. Gp.: 222

PATENT NOTICES

Certificates of Correction for the Week of Sept. 27, 1977

Re. 28,620	4,022,989	4,028,035	4,033,454
D. 224,284	4,023,108	4,028,274	4,033,542
3,752,828	4,023,544	4,028,363	4,033,552
3,778,918	4,023,561	4,028,495	4,033,677
3,781,061	4,023,779	4,028,621	4,033,690
3,806,482	4,023,814	4,028,871	4,033,695
3,833,358	4,023,922	4,028,892	4,033,702
3,908,200	4,023,993	4,028,942	4,033,770
3,925,009	4,024,159	4,028,960	4,033,783
3,926,826	4,024,183	4,029,145	4,033,802
3,964,871	4,024,197	4,029,243	4,033,814
3,965,199	4,024,256	4,029,336	4,033,822
3,969,199	4,024,278	4,029,459	4,033,825
3,975,099	4,024,362	4,029,512	4,033,833
3,978,366	4,024,372	4,029,618	4,033,897
3,980,624	4,024,458	4,029,626	4,033,917
3,988,026	4,024,459	4,029,653	4,033,931
3,989,040	4,024,506	4,029,669	4,033,965
3,991,161	4,024,571	4,029,682	4,033,980
3,992,294	4,024,592	4,029,694	4,034,007
3,993,115	4,024,762	4,029,732	4,034,067
3,993,746	4,024,785	4,029,751	4,034,115
3,995,689	4,024,865	4,029,819	4,034,157
3,995,744	4,024,980	4,030,129	4,034,201
4,003,817	4,025,036	4,030,269	4,034,295
4,005,040	4,025,172	4,030,365	4,034,394
4,005,153	4,025,197	4,030,412	4,034,423
4,006,170	4,025,319	4,030,424	4,034,450
4,010,169	4,025,527	4,030,450	4,034,456
4,010,214	4,025,680	4,030,525	4,034,507
4,010,310	4,025,707	4,030,650	4,034,581
4,011,278	4,025,709	4,030,894	4,034,620
4,011,583	4,025,817	4,031,041	4,034,631
4,012,472	4,025,847	4,031,145	4,034,650
4,012,473	4,025,959	4,031,328	4,034,781
4,012,919	4,026,020	4,031,332	4,034,804
4,013,589	4,026,078	4,031,344	4,034,828
4,014,942	4,026,101	4,031,345	4,034,893
4,015,014	4,026,123	4,031,460	4,035,030
4,016,427	4,026,132	4,031,468	4,035,064
4,017,007	4,026,243	4,031,484	4,035,084
4,017,078	4,026,327	4,031,788	4,035,113
4,017,193	4,026,341	4,031,867	4,035,150
4,018,574	4,026,452	4,031,911	4,035,261
4,018,805	4,026,460	4,032,248	4,035,275
4,019,002	4,026,614	4,032,279	4,035,298
4,019,265	4,026,648	4,032,307	4,035,306
4,019,478	4,026,787	4,032,439	4,035,308
4,019,488	4,026,822	4,032,515	4,035,332
4,019,646	4,026,861	4,032,540	4,035,336
4,019,999	4,026,900	4,032,602	4,035,337
4,020,368	4,026,908	4,032,619	4,035,515
4,020,593	4,026,948	4,032,805	4,035,551
4,020,802	4,026,984	4,032,915	4,035,560
4,021,180	4,027,011	4,032,920	4,035,614
4,021,255	4,027,148	4,032,971	4,035,626
4,021,377	4,027,242	4,033,214	4,035,777
4,021,565	4,027,396	4,033,237	4,035,826
4,021,567	4,027,451	4,033,289	4,035,890
4,021,654	4,027,675	4,033,292	4,035,921
4,021,829	4,027,691	4,033,357	4,036,085
4,021,917	4,027,794	4,033,377	4,036,200
4,022,552	4,027,968	4,033,431	4,036,822
4,022,962	4,027,972	4,033,438	4,036,888

Title of Invention Carried on Office Records

The Patent and Trademark Office is experiencing an increased incidence in the number of newly filed applications in which the title of the invention is inconsistent within the papers. This has resulted in applicants requesting correction of the official filing receipt in many instances to indicate the title preferred by applicants.

Hereafter, whenever the title of the invention appears inconsistent within the papers of a newly filed application for patent, the records of the Office will carry the title as indicated on the first page of the specification and no corrected filing receipt will be issued to indicate another title. Note that 37 CFR 1.72(a) indicates that the title of the invention should appear as a heading on the first page of the specification.

It should also be noted that applicant may amend the title under 37 CFR 1.115 if any changes are subsequently desired before issuance of a patent.

BRADFORD R. HUTHER,
Acting Assistant Commissioner for Administration.

Aug. 31, 1977.

Public Hearing on Relocation of Offices

During the past eighteen months, the Patent and Trademark Office has been attempting to acquire additional office space. The PTO's Public Search Room for Patents currently lacks file expansion capability and its Patent Documentation staff has been seriously overcrowded for some time with some of the staff being located at an adjacent office complex.

Past efforts to locate space in the Crystal City area have not been successful and it appears unlikely that space will become available in this area within the foreseeable future. The General Services Administration recently offered the PTO approximately 36,000 square feet of space in the top four floors of a modern office building which is located at 1000 N. Glebe Road in Arlington, at the intersection of Glebe Road and Fairfax Drive and between Wilson Boulevard and Washington Boulevard. This site, which is approximately five miles from the PTO's Crystal Plaza location, is readily accessible by public transportation. In view of the PTO's urgent need for space, and after careful consideration of all possible alternatives, it has been decided to accept this offer of additional space.

Affected employees and members of the public will have an opportunity to comment before a decision is made on the units to move to the Glebe Road building. Two options are currently being considered and in each instance the number of employees involved is approximately 170. The first consists of shifting most trademark-related functions and the Board of Patent Interferences. The other option would include the Board of Appeals, the Office of Publications and the Board of Patent Interferences.

A public hearing on this subject will be held on October 7, 1977 in the Jefferson Room of the Hospitality House Motor Inn, 2000 Jefferson Davis Highway, Arlington, Virginia. The meeting will commence at 10:00 A.M. and terminate not later than 3:00 P.M. Individuals who wish to participate in this meeting should contact Bradford R. Huther (703) 557-2290 by noon, October 6, 1977.

Sept. 22, 1977. LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF AUGUST 27, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-30-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-17-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-1-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	10-21-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-6-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	7-26-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	6-7-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	8-17-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	3-8-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-25-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-15-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	10-5-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	11-24-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	9-3-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	9-16-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	1-3-77

Expiration of patents: The patents within the range of numbers indicated below expire during August 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,947,001 to 2,951,248, inclusive
Plant Patents..... Numbers 1,963 to 1,969, inclusive

REISSUES

SEPTEMBER 27, 1977

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

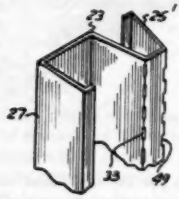
Re. 29,412
STUDS

Daniel L. Zinn, 2545 Beaufait, Detroit, Mich. 48207

Original No. 3,841,047, dated Oct. 15, 1974, Ser. No. 382,606, July 25, 1973. Division of Ser. No. 257,943, May 30, 1972, abandoned, which is a division of Ser. No. 74,022, Sept. 21, 1970, abandoned. Application for reissue Nov. 20, 1975, Ser. No. 633,748

Int. Cl.² E04C *3/07*

U.S. Cl. 52—720 **7 Claims**



1. An improved stud having a bearing flange, a mounting flange and a web joining the mounting flange to the bearing flange, said stud for use in a wall made up of a line of substantially identical studs and wall panels on opposite sides of the wall, with the studs alternated in reversed arrangement so that on each side of the wall the mounting flanges alternate with the bearing flanges; each pair of adjacent wall panels on each side of the wall having their adjacent panel edges fastened to a mounting flange and with each panel on each side of the wall having its central part bearing against a bearing flange; the improvement comprising:

said bearing flange and said mounting flange being substantially parallel and aligned on opposite sides of said web, said web including first and second legs interconnected by a transverse member, said transverse member being non-parallel relative to said bearing flange and said mounting flange;

each bearing flange and each mounting flange and its juncture with the web being so formed that the entire bearing flange will deflect a greater amount, from the web-flange juncture to the free end of the flange, than the deflection of the mounting flange from its web-flange juncture to its free end under the same loading at the same distance from the respective web-flange junctures;

said mounting flange providing a stiffer, less resilient mounting for the adjacent edges of a pair of panels so that when the panels are fastened to a mounting flange the panels are retained firmly and snugly against the mounting flange in a manner to avoid deflection inwardly or outwardly from the plane of such panels;

said bearing flange providing a more resilient bearing for the center of a panel having its edges fastened to a pair of mounting flanges, so that the center of the panel and the bearing flange flex inwardly resiliently for sound attenuation, but with the center of the panel being free of outward bias from the bearing flange, which bearing flange is formed to be free of a tendency to deflect outwardly, though it is resilient enough to be flexed inwardly by outward sound waves impinging against the panel, *said bearing flange and said mounting flange each being substantially smooth and substantially free of internal and external protuberances between its edges; so that substantially the entire area of such bearing flange provides a resilient overall bearing area for the adjacent central part of a panel.*

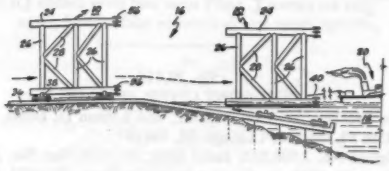
Re. 29,413
METHOD AND APPARATUS FOR FABRICATING AN OFF-SHORE STRUCTURE

Eero M. Hekkanen, Walnut Creek, Calif., and Alpo J. Tokola, Portland, Oreg., assignors to Kaiser Steel Corporation, Oakland, Calif.

Original No. 3,641,774, dated Feb. 15, 1972, Ser. No. 7,182, Jan. 30, 1970. Application for reissue Feb. 15, 1974, Ser. No. 443,003

Int. Cl.² E02D *21/00*; B63B *35/40*; B63C *13/00*

U.S. Cl. 61—96 **35 Claims**



1. The method of fabricating a modular offshore structure comprising the steps of transporting at least a pair of individual structural modules each of which is made up of interconnected and floatable watertight legs from an onshore site to a preselected offshore site, then while the said pair of modules are partially submerged in water at the offshore site selectively controlling the ballast in the watertight legs of each module of the pair of modules and maneuvering said pair of modules relative to each other until the legs of one module are fully aligned with the legs of the other and opposed module, progressively drawing said aligned legs of the pair of opposed modules together until they are abutted, and while holding the abutted legs of the modules firmly clamped together rigidly securing one leg of a pair of abutted legs to the other leg of said pair of legs.

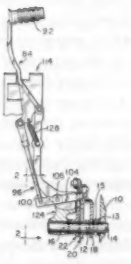
Re. 29,414
SHIFT MECHANISM FOR MECHANICAL TRANSMISSIONS

Josef F. Prokop, Downers Grove, Ill., assignor to International Harvester Company, Chicago, Ill.

Original No. 3,730,010, dated May 1, 1973, Ser. No. 185,107, Sept. 30, 1971. Application for reissue July 2, 1975, Ser. No. 592,569

Int. Cl.² G05G *5/10*

U.S. Cl. 74—477 **8 Claims**



1. A shift mechanism for a mechanical transmission having several gear sets comprising:

a support shaft means,
a latch means,
a lever means *having a junction therein* for actuating said latch means [progressively] *by progressive pivoting* in a first and second plane, and being journalled by said support shaft means,
an outer lever means adapted to be connected to said transmission having a gap means capable of accommodating said latch and being journalled by said support shaft means;
an inner lever means adapted to be connected to said transmission having a gap means capable of accommodating said latch and being journalled by said support shaft means; and
a single gate means having a gap means capable of passing said latch means and a base fixed to said support shaft means whereby when said gaps are orientated in *the neutral position of* said second plane, said latch is movable in an up and down manner therein to engage a transmission gear set means [, and] *upon* said lever means [is moved] *pivoting about said junction* in said second plane.

Re. 29,415

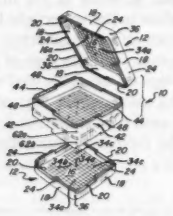
FOOD CONTAINER ASSEMBLY

Sam Ricobene, 250 W. 26th St., and Lyman D. Dunn, 325 W. 25th Pl., both of Chicago, Ill. 60616

Original No. 3,908,852, dated Sept. 30, 1975, Ser. No. 287,651, Sept. 11, 1972. Application for reissue Sept. 20, 1976, Ser. No. 724,499

Int. Cl.[2] A45C *11/20*; B65D *1/24, 21/02*

U.S. Cl. 206—550 **4 Claims**



3. A container assembly comprising:

a bottom panel having a bottom wall with an inner face defining a support surface in the form of a plurality of intersecting channels, said channels in turn defining therebetween a plurality of pads for supporting a food product, a plurality of ports in said bottom wall for air communication of said channels with the exterior of said container for entry of air into said channels, said bottom panel also having upstanding side wall means terminating at an upper edge defining an irregular offset portion, vent ports in said side wall means for emission of vapors to the exterior of said container assembly; a top panel identical to said bottom panel to fit on top of the bottom panel and having an inner bottom face, and a plurality of side walls depending from the inner face and terminating in a downwardly facing lower edge identical to said upstanding side wall of said bottom panel edge and adapted to matingly interengage with said upstanding bottom panel side wall upper edge, a plurality of vents in the top panel side wall for emission of vapors to the exterior of said container assembly said top panel having on its upper surface a plurality of transverse intersecting channels defining a plurality of pads capable of supporting a food product when in use as a bottom panel with said channels forming conduits for air flow from the bottom panel vent ports through the container and exiting from said top panel vent ports and said side wall vent ports to keep the food product crisp.

Re. 29,416

EQUIPMENT FOR THE CONTINUOUS PRODUCTION OF PANELS OF SYNTHETIC MATERIAL

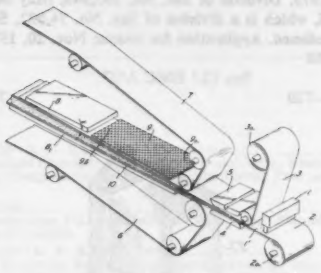
Jean-Marie Raymond Peille, Esperaza, France, assignor to Societe Industrielle de Stratifies, Esperaza, France

Original No. 3,841,811, dated Oct. 15, 1974, Ser. No. 224,055, Feb. 7, 1972. Application for reissue Mar. 17, 1976, Ser. No. 667,765

Claims priority, application France, Feb. 12, 1971, 71.04913

Int. Cl.[2] B29D *27/00*

U.S. Cl. 425—115 **1 Claim**



3. An apparatus for the continuous manufacture of panels comprised of expanded synthetic material of the type where a facing is applied to the upper and lower sides of the synthetic material comprising a flow path along which said panels are manufactured, means adjacent said flow path for supplying said upper and lower facings in continuous sheets along said flow path, means adjacent said supplying means for depositing said synthetic material between said sheets while said synthetic material is substantially in its liquid phase, first means for shaping said synthetic materials, said first means being disposed in contact with each of said facing sheets and having outlet through which said facing sheets, second means for shaping said synthetic material, said second means comprising first and second conveyor bands which are disposed above and below said flow path and which are in engagement with said upper and lower facing, said bands extending downstream from said outlet of said first means so that as said synthetic material expands, its shape is maintained by said conveyor bands, first and second shaping plates disposed above and below said upper and lower conveyor bands and in contact therewith, a flexible mesh form belt being applied to the outer surface of said first conveyor band, said belt extending from substantially the entrance of said facing sheets into said conveyor bands to said shaping plate disposed above said upper conveyor, the upstream portion of said flexible mesh form belt overlying that part of said flow path where said synthetic material is still in its liquid state, the downstream portion of said flexible mesh form belt being deformable in all directions and overlying that part of said flow path where the synthetic material is undergoing expansion, and the distance between the downstream end of said flexible mesh form belt and the upstream end of said shaping plate disposed above said conveyor is as small as possible to reduce the angle between the contacting face of said shaping plate and the facing sheet in contact therewith so that pockets and folds cannot form between said flexible mesh form belt and said shaping plate.

Re. 29,417

PAPERMAKING SYSTEM INCLUDING A FLEXIBLE CERAMIC MEMBER HAVING A PRE-LOADED TENSILE FORCE APPLYING MEANS

Charles A. Lee, Knoxville, and Robert F. Hunt, Concord, both of Tenn., assignors to International Paper Company, New York, N.Y.

Original No. 3,871,953, dated Mar. 18, 1975, Ser. No. 455,678, Mar. 28, 1974. Continuation-in-part of Ser. No. 273,027, July 19, 1972, abandoned, Ser. No. 273,307, July 19, 1972, abandoned, and Ser. No. 377,893, July 10, 1973, abandoned. Application for reissue Nov. 11, 1976, Ser. No. 740,932

Int. Cl.[2] D21F *1/48*; D21G *3/00*

U.S. Cl. 162—274 **13 Claims**

1. In a papermaking system including at least two members one of which is movable relative to the other and in frictional

engagement therewith, and in which system at least one of said members is subjected to deflection, the improvement wherein said latter member comprises

an elongated flexible assemblage including a plurality of ceramic segments, each having at least two opposite surfaces that are substantially flat and parallel, said segments being aligned with their flat faces in abutting face-to-face relation and in respective planes that are oriented substantially perpendicular to the composite length of said plurality of segements,

tension means extending between opposite ends of said assemblage and forcing said segments toward each other in a direction along their composite length and substantially perpendicular to their respective parallel faces with a preload force on said tension means, when said latter member is in an undeflected condition, that is at least the force calculated by the equation:

$$P = [(E_cA_c)(8dh/l^2 + 4d^2)/2\ [(L)]] + [(\alpha_s - \alpha_c)\Delta T]/[(1/A_sE_s) + A_cE_c)]$$

where:

P is the preload of said tension means, in pounds;

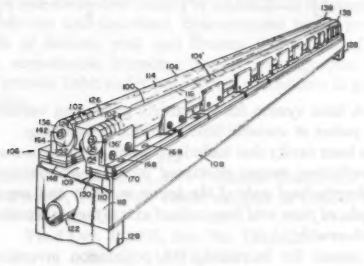
E_c is the modulus of elasticity of the ceramic material;

A_c is the cross-sectional area of a ceramic segment in a plane perpendicular to the composite length of said assemblage, in square inches;

d is the maximum anticipated deflection of said assemblage, in inches,

h is the dimension of a ceramic segment in the plane perpendicular to the composite length of said assemblage and in alignment with the direction of said deflective force, in inches;

l is the overall length of said assemblage;



α_s is the coefficient of thermal expansion of said tension means;

α_c is the coefficient of thermal expansion of said ceramic;

ΔT is the degrees of temperature change anticipated, in degrees F.;

A_s is the cross-sectional area of said tension means;

E_s is the modulus of elasticity of said tension means, [and

L is the length of a ceramic segment, in inches,]

but less than the amount of force which will compress said ceramic to over about one-half of its maximum compressive strength,

an elongated smooth working surface extending along the length of said latter member and defining an area of contact with said other member, and

means supporting said latter member relative to said other member with its longitudinal dimension oriented generally transversely of the direction of relative movement of said members whereby loading forces exerted upon said latter member are directed thereagainst in a direction substantially perpendicular to the longitudinal dimension thereof and deflection of said latter member pursuant to such loading forces is compensated for in said compressed segments by further compression of said segments in those portions of the abutting faces thereof disposed along the inside of the line of curvature of said latter member and by relief of less than all of the compression in those portions of said abutting faces that are disposed along the outside of said line of curvature of said member without physical separation of said segments at their abutting faces.

Re. 29,418

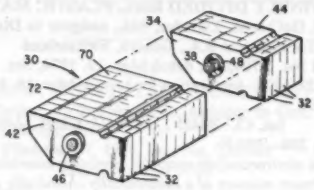
FLEXIBLE CERAMIC MEMBER HAVING A PRE-LOADED TENSILE FORCE APPLYING MEANS

Robert F. Hunt, Concord, Tenn., assignor to International Paper Company, New York, N.Y.

Original No. 3,869,344, dated Mar. 4, 1975, Ser. No. 377,894, July 10, 1973. Continuation-in-part of Ser. No. 273,308, July 19, 1972, abandoned. Application for reissue Nov. 11, 1976, Ser. No. 741,049

Int. Cl.² D21F 1/48; D21G 3/00

U.S. Cl. 162—274 **7 Claims**



1. In a system including at least two members one of which is movable relative to the other and in frictional engagement therewith, such as members in a papermaking system, the improvement wherein the other member is an elongated flexible ceramic element comprising

a plurality of ceramic segments, each having at least two opposite surfaces that are substantially flat and parallel, said segments being aligned with their flat faces in abutting face-to-face relation and in respective planes that are oriented substantially perpendicular to the composite length of said plurality of segments,

tension means anchored to opposite ends of said element and forcing said segments toward each other in a direction along their composite length and substantially perpendicular to their respective parallel faces with a preload force on said tension means, when said latter member is in an undeflected condition, that is at least the force calculated by the equation:

$$P = \frac{E_cA_c\frac{8dh}{l^2 + 4d^2}\ [(L)]}{2} + \frac{(\alpha_s - \alpha_c)\Delta T}{\frac{1}{A_sE_s} \quad \frac{1}{A_cE_c}}$$

where:

P is the preload of said tension means, in pounds;

E_c is the modulus of elasticity of the ceramic material;

A_c is the cross-sectional area of a ceramic segment in a plane perpendicular to the composite length of said elongated ceramic element in square inches;

d is the maximum anticipated deflection of said elongated ceramic element, in inches;

h is the dimension of a ceramic segment in the plane perpendicular to the composite length of said elongated ceramic element and in alignment with the direction of said deflective force, in inches;

l is the overall length of said latter member;

α_s is the coefficient of thermal expansion of said tension means;

α_c is the coefficient of thermal expansion of said ceramic;

Δ_T is the degree of temperature change anticipated, in degrees F.;

A_s is the cross-sectional area of said tension means,

E_s is the modulus of elasticity of said tension means, [and L is the length of a ceramic segment, in inches,]

but less than the amount of preload force which will compress said ceramic to over about one-half of its maximum compressive strength,

whereby loading forces exerted upon said elongated ceramic element are directed thereagainst in a direction substantially perpendicular to the longitudinal dimension thereof and deflection of said elongated ceramic element pursuant to such loading forces is compensated for in said compressed segments by further compression of said segments in those portions of the abutting faces thereof disposed along the inside of the line of curvature of said elongated ceramic element and by relief of less than all of the compression in those portions of said abutting faces that are disposed along the outside of said line of curvature of said elongated ceramic element without physical separation of said segments at their abutting faces.

Re. 29,419

FINELY DIVIDED RuO_2/PLASTIC MATRIX

Denis F. DeCraene, Elkridge, Md., assignor to Diamond Shamrock Technologies S.A., Geneva, Switzerland

Original No. 3,798,063, dated Mar. 19, 1974, Ser. No. 203,059, Nov. 29, 1971. Application for reissue Mar. 16, 1976, Ser. No. 667,454

Int. Cl.[2] B44D *1/34, 1/18;* **C25B** *11/08*

U.S. Cl. 204—290 F **11 Claims**

10. An electrocatalytic material consisting essentially of a solidified intimate mixture of a substantially chemically and mechanically inert organic polymer and an electrocatalyst of finely divided RuO_2 having a particle size of less than 0.5 microns.

Re. 29,420

SINTERED CEMENTED CARBIDE BODY COATED WITH TWO LAYERS

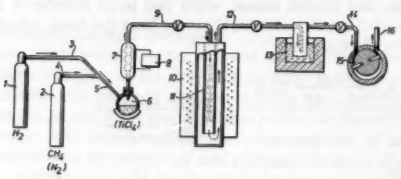
Jan Nils Lindstrom, Hagersten; Bo Folke Jonsson, Huddinge, and Fall Johan Olof William Ohlsson, Enskede, all of Sweden, assignors to Sandvik Aktiebolag, Sandviken, Sweden

Original No. 3,837,896, dated Sept. 24, 1974, Ser. No. 303,362, Nov. 3, 1972. Application for reissue Mar. 26, 1975, Ser. No. 562,013

Claims priority, application Sweden, Nov. 12, 1971, 14479/71

Int. Cl.[2] C23C *11/14, 13/02;* **C23D** *5/00*

U.S. Cl. 428—336 **4 Claims**



1. Compound body consisting of a core or substratum of sintered cemented carbide containing a small quantity of a binder metal, on which core or substratum is a very thin and extremely uniform surface coating with higher wear resistance than that of the core or substratum, in which said thin coating consists of two layers applied one above the other by chemical vapor deposition, neither of the layers containing binder metal, the outer layer having a thickness of 0.2–20 μm and consisting of at least one extremely wear resistant deposit consisting essentially of ceramic material selected from the group consisting of aluminum oxide and zirconium oxide and the inner layer lying next to the core or substratum having a thickness of 1–10 μm and consisting of at least one coat of at least one member selected from the group consisting of the carbides and nitrides of Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Si and B.

4. Compound body consisting of a core or substratum of sintered cemented carbide containing a small quantity of a binder metal, on which core or substratum is a very thin and extremely uniform surface coating with higher wear resistance than that of the core or substratum, in which said thin coating consists of two layers applied one above the other by chemical vapor deposition, neither of the two layers containing binder metal, the outer layer having a thickness of 0.2–20 μm and consisting of at least one extremely wear resistant deposit consisting essentially of a member of the group consisting of aluminum oxide, titanium oxide and zirconium oxide, and the inner layer lying next to the core or substratum having a thickness of 1–10 μm and consisting of at least one coat of at least one member selected from the group consisting of the carbides and nitrides of Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Si and B.

Re. 29,421

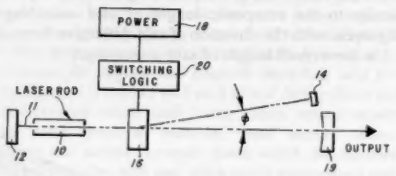
LASER SYSTEM HAVING ELECTRONICALLY SELECTABLE GAIN

Warner C. Scott, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Original No. 3,725,812, dated Apr. 3, 1973, Ser. No. 147,049, May 26, 1971. Application for reissue Sept. 4, 1973, Ser. No. 394,001

Int. Cl.[2] H01S *3/11*

U.S. Cl. 331—94.5 Q **19 Claims**



1. A laser system for selectively producing variable energy laser pulses at variable time intervals comprising:

a. a laser cavity that includes a lasing medium *and at least one reflecting means positioned along a line intersecting the longitudinal axis of the lasing medium and angularly displaced from said longitudinal axis to form a preselected angle therewith;*

b. means for increasing the population inversion in said lasing medium to stimulate emission of a beam of energy therefrom;

c. control means disposed within said laser cavity for selectively controlling both the energy level of respective output pulses and the time duration between successive pulses, said control means effective to deflect a fraction of said beam at [a] *said* preselected angle responsive to application of ultrasonic power thereto, said fraction being a monotonic increasing function of said ultrasonic power; and

d. logic circuitry connected to said control means for selectively applying said ultrasonic power at selected power levels to control the fraction of said beam deflected at said angle, said deflected fraction being reflected *by said at least one reflecting means* to provide energy feedback to said lasing medium, a laser output pulse being produced responsive to said reflected fraction lowering the lasing threshold of said cavity to a value below the level of population inversion in said lasing medium at that time, the energy of said pulse being defined by the amount that said lasing threshold is lowered below the population inversion level.

PLANT PATENTS

GRANTED SEPTEMBER 27, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,111
PIERIS JAPONICA - ZEBRIS VARIETY

Alex J. Zebehazy, Perry, Ohio, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed May 20, 1976, Ser. No. 688,365
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—54 **1 Claim**

1. A new and distinct variety of *Pieris japonica* of the evergreen shrub type substantially as shown and described, characterized particularly as to novelty by the unique combination of the new shoots having brilliant reddish-purple color on the new leaves and stems; the highly decorative growth of even, compact, upright habit, vigorous and freely branched; greater winter hardiness and disease resistance; with more abundant leaves of larger size with darker green color and which hold this color over the winter; with flowers which open and mature 7 to 10 days later, and young stems and branches having a more even reddish winter color.

4,112
AZALEA PLANT NAMED COTTON CANDY

Alfred N. Roberts, Corvallis, Oreg., assignor to Geo. J. Ball, Inc., West Chicago, Ill.

Filed Oct. 1, 1976, Ser. No. 728,952
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—56 **1 Claim**

1. A new and distinctive variety of azalea plant substantially as herein shown and described, characterized by its prolific production of delicate pink and creamy white, ruffled and puckered, semi-double blossoms; and by its vigorous, well branched growth habit under pot-forcing procedures in greenhouse culture.

4,113
AFRICAN VIOLET PLANT NAMED RACHEL

Arnold W. Fischer, Fallbrook, Calif., assignor to Geo. J. Ball, Inc., West Chicago, Ill.

Filed Oct. 7, 1976, Ser. No. 730,662
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct variety of African violet plant substantially as herein shown and described, characterized by its soft blue flowers which are delicately margined with a narrow band of white, by its strong and durable growth habit which performs well under much less than optimum conditions, and by its abundant year around production of flowers which are held on strong stems well above the foliage.

4,114
AFRICAN VIOLET PLANT NAMED DOLLY

Arnold W. Fischer, Fallbrook, Calif., assignor to Geo. J. Ball, Inc., West Chicago, Ill.

Filed Oct. 7, 1976, Ser. No. 730,663
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet substantially as herein shown and described, characterized by its medium to large blue and white bi-colored blossoms, its very fast and vigorous growth habit, and its profuse year around blooming capability.

4,115
AFRICAN VIOLET PLANT NAMED ABBY

Arnold W. Fischer, Fallbrook, Calif., assignor to Geo. J. Ball, Inc., West Chicago, Ill.

Filed Oct. 7, 1976, Ser. No. 730,664
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinctive variety of African violet plant, substantially as herein shown and described, characterized by its relatively large and uniquely displayed white flowers which are borne on sturdy stems and arranged in a circular pattern above an abundant array of large foliage.

4,116
ALMOND TREE

Samuel M. Reynolds, 3804 Washington Blvd., Livingston, Calif. 95334

Filed Nov. 10, 1976, Ser. No. 740,474
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—30 **1 Claim**

1. A new and distinct variety of almond tree, substantially as illustrated and described, which is of medium size, dense, vigorous, spreading, abundantly foliated with medium size, acuminate, acutely pointed leaves having a crenate, finely serrate margin, and alternate, globose glands on the petiole, blooms heavily with white flowers, and regularly heavily bears large, well-distributed nuts having a medium size kernel; the variety being particularly characterized, in comparison to the Nonpareil, by sturdier branches, denser growth, more upright tree structure, a blooming period about one week later, less pre-harvest nut drop and easier harvest detachment, a harvest period about a week later, higher crack-out of kernels, and kernels which are more plump.

PATENTS

GRANTED SEPTEMBER 27, 1977

ERRATA

For CLASS	See PATENT NO.
407–107	4,050,127
407–059	4,050,128
407–045	4,050,129
057–058.89	4,050,235
072–037	4,050,271
090–001.6 R	4,050,350
101–349	4,050,383
366–339	4,050,676
366–011	4,050,677
366–130	4,050,678
293–071 P	4,050,689
351–120	4,050,785
418–131	4,050,855
428–617	4,050,906
544–021	4,051,129
544–011	4,051,130
544–028	4,051,131
544–020	4,051,132
544–018	4,051,133
544–217	4,051,134
023–259.5	4,051,135
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560–040	4,051,169
560–062	4,051,170
560–157	4,051,171
526–090	4,051,172
560–255	4,051,173
560–234	4,051,174
235–130 R	4,051,349
364–432	4,051,350
364–400	4,051,351
364–716	4,051,352
364–716	4,051,353
364–726	4,051,357
364–716	4,051,358
362–004	4,051,359
362–363	4,051,360
362–211	4,051,361
362–432	4,051,362
361–415	4,051,414
363–131	4,051,426

PATENTS

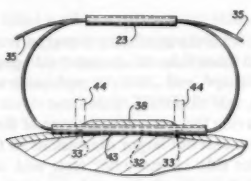
GRANTED SEPTEMBER 27, 1977

GENERAL AND MECHANICAL

4,050,099
SHOULDER PROTECTOR
Nel E. David, 1342 SW. 17th St., Miami, Fla. 33145
Filed Jan. 15, 1976, Ser. No. 649,536
Int. Cl.[2] A41B *13/10*
U.S. Cl. 2—46 **7 Claims**

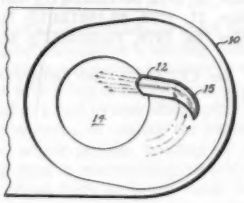
1. A protective garment for the shoulder of a wearer comprising; a first liquid impervious layer, a second padded layer, and a third liquid absorbing layer, each of said layers being secured to the others by fastening means along at least some of the outside edges of said layers, means for positively securing said garment on a person wearing same, the first and third layers are of long substantially rectangular shaped pieces with stitching completely along the outside edges thereof to firmly fasten said layers together, and the second padded layer being much shorter than the first and third layers and being secured in place at the mid-portion only and between said first and third layers by the same stitching that secures them together.

4,050,100
PERMANENTLY IMPLANTED HAIR PIECE ATTACHING MEANS
Robert J. Barry, 76 Cedargrove Road, Little Falls, N.J. 07424
Filed May 12, 1976, Ser. No. 685,650
Int. Cl.[2] A61F *1/00*; A61B *17/00*
U.S. Cl. 3—1 **7 Claims**



1. A scalp implant for attaching a hair piece to the scalp comprising a needle adapted to puncture the scalp generally parallel to the surface of the skull and thereby form entrance and exit puncture openings in the scalp, a trailing tube of tissue-compatible material attached to the needle and adapted to be severed therefrom after the needle has drawn said tube into implanted relationship with the scalp with opposite ends of the tube extending substantially equidistantly outside of the scalp beyond said entrance and exit puncture openings, a metallic sleeve bushing contained bodily within said tube and having a central main portion substantially equal in length to the distance between said entrance and exit puncture openings and comparatively short end portions adapted to be bent upwardly approximately at right angles to said central main portion to thereby project outwardly of and above the scalp, said comparatively short end portions of the bushing being substantially equal in length to corresponding end portions of said tube within which said metallic sleeve bushing is contained, and said tube end protions being bendable with said short end portions of the metallic bushing, a substantially straight tubular lock formed separately from and substantially equal in length to said central main portion of said metallic bushing, and a lock bar attaching wire threadable through said bushing and said lock bar and adapted when tightened and secured to position said lock bar between the tops of the comparatively short upwardly bent bushing and tube end portions with the lock bar outside of the scalp and substantially parallel to said central main portion of the bushing and spaced therefrom, whereby said implant is in the form of a closed substantially rectangular loop.

4,050,101
BAFFLE FOR TOILET BOWL
Clyde Sherman Logue, 119 Minerva Road, Daytona Beach, Fla. 32020
Filed May 21, 1975, Ser. No. 579,713
Int. Cl.[2] A47K *17/00*
U.S. Cl. 4—1 **6 Claims**



1. A baffle adapted to divert water in a conventional toilet bowl, wherein the said bracket is located in a commode equipped with an exit waste conduit at the base thereof, consisting of a base member and a contiguous wall member secured to one edge of said base member forming an angle therebetween in the range of from 90° to 135° wherein, the base member and the wall member each comprise a straight section and an adjacent curved section, the said base member having a forward edge and the contiguous wall member having an upward edge, wherein, in the curved section of the base member and in the curved section of the wall member the forward edge of the curved section of the base member and the upward edge of the wall member diverge at onc end to a rounded point.

4,050,102
RECIRCULATING TOILET SYSTEM
James M. Kemper; Robert J. O'Neill; Bruce E. Wagenhals, and Jack W. Adams, all of Santa Monica, Calif., assignors to Monogram Industries, Inc., Los Angeles, Calif.
Filed Mar. 5, 1976, Ser. No. 664,299
Int. Cl.[2] E03D *5/16*
U.S. Cl. 4—10 **8 Claims**

1. In a recirculating toilet system comprising at least one human waste receiving receptacle, separating means including a separating tank coupled to said receptacle for receiving human waste therefrom, a layer of non-aqueous flushing fluid, substantially immiscible with water and human waste and having relatively lower density and specific gravity and a conductivity different than water, disposed in said tank, flushing fluid intake means in said separating tank including a float member capable of floating substantially at the surface of said flushing fluid for withdrawing flushing fluid therefrom, and motor activated flushing fluid recirculating means coupled to both said intake means and said receptacle for withdrawing

flushing fluid from said tank into said receptacle, the improvement which comprises:

detecting means associated with said intake means for detecting the presence of wastewater in the flushing fluid adjacent said intake means and deactivating the motor of said recirculating means when the presence of a predetermined amount of wastewater is detected in said flushing fluid, said detecting means including a pair of spaced probes extending down into said flushing fluid to a depth at least normally above the interface between said flushing fluid and said water and human waste, and circuit means operatively connecting each of said probes to said motor creating a potential across said probes normally retaining said motor in operative condition when said probes contact said flushing fluid and said circuit means further including sensing means adapted to sense the current flow between said probes and deactivate said motor when the sensed current between the probes indicates the presence of sufficient water and human waste therebetween.

4,050,103

URINATING RECEIVER

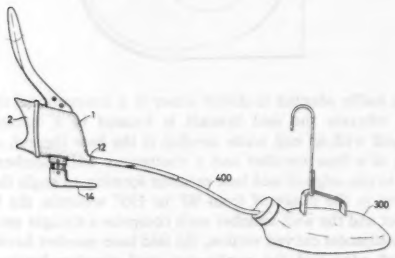
Shinroku Nakao, Yokohama; Yoshiyasu Ishii, and Kenshun Ishii, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan

Filed Nov. 5, 1976, Ser. No. 739,378

Claims priority, application Japan, Nov. 10, 1975, 50-152823[U]; Nov. 10, 1975, 50-152824[U]; Nov. 10, 10, 1975, 50-152825[U]; Nov. 21, 1975, 50-158134[U]; Nov. 27, 1975, 50-160601[U]; Mar. 10, 1976, 51-28240[U]; Mar. 10, 1976, 51-28241[U]

Int. Cl.² A61G *9/00*; A47K *11/12*

U.S. Cl. 4—110 **12 Claims**



1. A urinating receiver comprising: a receiver body having an open front end and a closed rear end, a connecting pipe for connecting said receiver body to a urine storing tank through a urine discharge pipe protruding from the lower portion of said rear end; a contact frame made of elastic material, said contact frame having a base end detachably secured to the front end of said receiver body, and a front end recessed in the form of a curve; and holding and positioning means secured to said receiver body for placing said frame in contact with the circumferential area of a sexual organ.

4,050,104

TWO-IN-ONE PERIMETER GUTTER FOR SWIMMING POOLS

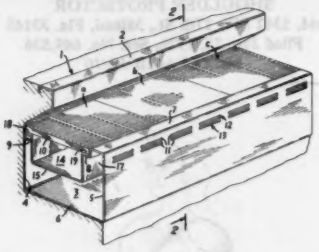
William H. Baker, 911 Rawlinson Road, Rock Hill, S.C. 29730

Continuation-in-part of Ser. No. 579,997, May 22, 1975. This application June 23, 1975, Ser. No. 589,725

Int. Cl.² E04H *3/20*

U.S. Cl. 4—172.17 **22 Claims**

1. A perimeter gutter for swimming pools comprising, in combination, first and second gutter conduits for disposition about the perimeter of a swimming pool, of which conduits at least one is an open gutter trough nested in and supported by the other gutter conduit; a retaining wall on the pool-side of the gutter conduits, over the top of which wall water may flow from the pool into the open gutter trough; the open gutter trough having at least one wall in common with the other gutter conduit separating available space of the other gutter conduit from available space of the gutter trough, of which



common wall at least a portion is removable, so that upon removal of the wall, said available spaces are combined and form a single gutter whose available space is at least the aggregate of the available space of both gutter conduits.

4,050,105

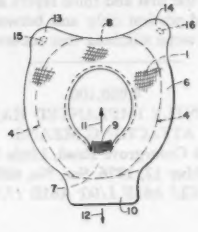
DISPOSABLE TOILET SEAT COVER

Lionel J. Marceaux, Abbeville, La., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 31, 1976, Ser. No. 672,052

Int. Cl.² A47K *13/14*

U.S. Cl. 4—243 **1 Claim**



1. A disposable toilet seat cover for a toilet seat having a top surface area for accommodating a user, a front central part, a back part, an inner side and an outer side providing a specific contour and shape, and a bottom surface area opposite the top surface area, said disposable toilet seat cover comprising

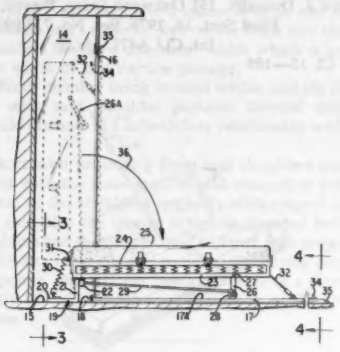
a cover having the contour and shape of the top surface area of a toilet seat but larger dimensions so that it hangs over the outer side of the toilet seat, said cover comprising paper flushable in a toilet, said paper being positionable on the top surface area of the toilet seat, foldable over the outer side of the toilet seat, and positionable on the bottom surface area of the toilet seat to maintain it in position, said cover having an inner center flap and an outer center flap consisting solely of paper and positioned at the front central part of the toilet seat, extending beyond said cover inwardly and outwardly, respectively, and foldable over the front central part of said toilet seat and positionable on the bottom surface area of said toilet seat, and having a pair of spaced flaps consisting solely of paper and positioned at the back part of the toilet seat, extending beyond said seat outwardly and foldable over the back part of said toilet seat and positionable on the bottom surface area of of said toilet seat, said flaps having self-adhesive thereon for removely affixing the cover to the bottom surface area of the toilet seat.

4,050,106

FOLDING BED ASSEMBLY

Lester Wolfe, 870 United Nations Plaza, New York, N.Y. 10017

Filed Apr. 28, 1976, Ser. No. 681,349
Int. Cl.² A47C *13/18*
U.S. Cl. 5—10 R 6 Claims



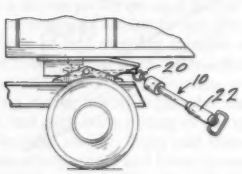
1. A wall bed pivotable between a vertical position into a wall recess and a substantially horizontal position out of the wall recess, comprising a mounting frame fixed to a floor within a wall recess, a bed frame having one end thereof pivotally connected to said mounting frame and pivotable between vertical and horizontal positions, first tension spring means interconnecting said one end of said bed frame and the floor of the wall recess, a panel having one end pivotally mounted to the floor and said panel being pivotable to a vertical position to close the wall recess and to conceal the bed therein and to a horizontal position upon the floor, means supporting said bed frame upon said panel when said bed frame and panel are both pivoted to their horizontal positions, and second tension spring means connecting the other end of said bed frame to said panel near the other end of said panel for pulling said other end of said bed frame and said panel toward each other such that said bed frame and panel are pivotable together simultaneously between vertical and horizontal positions, and said second tension spring means acting upon said other end of said bed frame to facilitate the pivoting of said bed frame from its vertical to its horizontal position upon pulling down on said other end of the panel.

4,050,107

TOOL FOR TRUCK OPERATORS

John N. Parma, 6749 Lincoln Green Road, Holland, Ohio 43528

Filed Apr. 30, 1976, Ser. No. 682,142
Int. Cl.² B25F *1/04*
U.S. Cl. 7—1 E 1 Claim



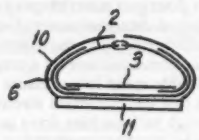
1. A combination tool for truck operators comprising in combination an elongate tubular rigid body, a pivoted handle at one end extending transversely normal to the axis of said body and movable from a position across said extended axis to either side thereof, a telescoping graduated depth gauge positioned on said rigid body at the handle end thereof and movable from a retracted position within said pivoted handle to an extended position beyond said pivoted handle when said pivoted handle has been pivoted to either side of said body axis, a second fixed handle circumjacent said one end of said body, a coaxially positioned cylindrical weight circumjacent said body at the other end thereof, and an extensible hook secured at said other end movable from a recessed position within said body and its cylindrical weight to an extended position axially outward from said other end of said body.

4,050,108

METHOD OF MANUFACTURING OF SHOES AND SHOES THUS MANUFACTURED

Rosette Londner, 32, rue du Calvaire, Saint-Cloud, Hauts de Seine, France

Filed Nov. 3, 1976, Ser. No. 738,542
Claims priority, application France, Nov. 13, 1975, 75.34652
Int. Cl.² A43D *9/00*; A43B *1/10*
U.S. Cl. 12—142 E 5 Claims



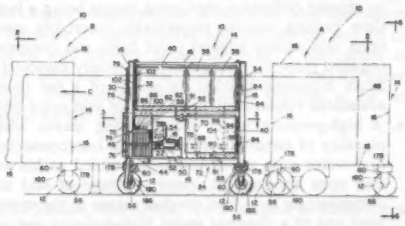
1. A method of manufacture of shoes by overmolding of a layer of plastic material on a starting element, wherein said method consists in making use of a starting element in the form of a high-cut sock lining of flexible material such as leather, for example, and in a first overmolding operation in employing a rigid plastic material, in coating the starting element with a composition which permits bonding of the corresponding material and then in overmolding on said starting element a part which forms both an instep shank for the sole, a rear stiffening counter and the heel seat or heel body, then in a second overmolding operation which entails the use of a relatively flexible plastic material and, after a second coating with a composition which permits bonding of the corresponding material, the complete assembly is overmolded with an outer coating which forms a covering for the upper and gives said upper its final shape and for the main body of the sole.

4,050,109

SELF-PROPELLED AND CONTAINED TRAILER WASHING MACHINE

Samuel M. Learned, R.D. No. 1, Port Townsend, Wash. 98368

Filed Dec. 2, 1976, Ser. No. 747,017
Int. Cl.² B60S *3/06*
U.S. Cl. 15—53 A 5 Claims



1. A self-propelled and contained trailer washing machine powered by an integrally assembled internal combustion engine which also concurrently drives an auxiliary electrical generator power unit and a hydraulic pump power unit respectively regulated through an integral machine drive and operational unit control console installed within a protectively enclosed driver/operator station wherein said machine is adapted

to mobily straddle the lateral rectangular shaped width and height configuration of a statically positioned over-the-road commercial trailer unit body and operable to successively and selectively accomplish a sequential low-pressure spray application of washing material upon and then brushing of the opposing longitudinal sides followed by a high-pressure water spray rinsing of the rear doors continuing in a longitudinally progressive simultaneous high-pressure water spray rinsing of the top and opposing longitudinal sides and finally a high-pressure water spray rinsing of the front panel of said trailer unit body during a single self-propelled laterally straddling longitudinally displaced driven pass of said machine along said trailer unit body, said machine comprising in combination:

a. an inverted U-shaped longitudinally disposed support frame structure having interconnected horizontal and vertical members assembled upon a plurality of driven wheels wherein said support frame structure is reinforced by a plurality of diagonally assembled threadably adjustable structural support brace struts,

b. a low-pressure detergent material spray application means wherein an integral detergent material storage tank assembled within and carried upon the support frame structure of said machine communicates by a conduit means to the intake of a variable speed low-pressure centrifugal pump powered by a first direct current electric motor variably regulated through said machine drive and operational unit control console, further communicating through said pump to a discharge side conduit extending therefrom in the form of an inverted U-shaped arch structure having a plurality of spaced longitudinally aligned spray nozzles threadably assembled in opposing relationship thereto along the interior vertical leg members thereof,

c. a low-pressure brightener material spray application means wherein an integral impervious plastic brightener material storage tank assembled within and carried upon the support frame structure of said machine communicates by a plastic conduit means to the intake of a variable speed low-pressure plastic centrifugal pump powered by a second direct current electric motor variably regulated through said machine drive and operational unit control console, further communicating through said plastic pump to a discharge side plastic conduit extending therefrom in the form of an inverted U-shaped arch structure having a plurality of spaced longitudinally aligned spray nozzles threadably assembled in opposing relationship thereto along the interior vertical leg members thereof.

d. a set of laterally spaced vertically disposed rotary brushes carried upon the support frame structure of said machine and adapted to simultaneously engage and scrub the opposing longitudinal sides of said trailer while being individually and respectively arcuately deflectable unidirectionally rearward of the direction of travel of said machine about a plurality of axially aligned pivot bolts and against the resistant force of a hydraulic compression cylinder wherein each of said set of rotary brushes is provided with an arcuate deflection tensioning means being a laminated shim bearing washer respectively insertably assembled upon said axially aligned pivot bolts and compressively engaged respectively against a vertically disposed rotary brush mounting bracket by means of a nut threadably assembled respectively upon each of said pivot bolts, and

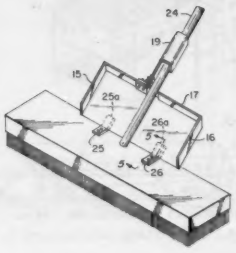
e. a high-pressure water spray rinsing means wherein a plurality of conduit communicating interconnected integral water rinse storage tanks assembled within and carried upon the support frame structure of said machine communicate by a feed conduit means to the intake of at least one of a constant speed high-pressure piston pump respectively powered by a fixed speed direct current electric motor operable through said machine drive and operational unit control console, further communicating through said piston pump to a discharge side conduit extending therefrom in the form of an inverted U-shaped arch structure having a plurality of spaced longitudinally aligned spray nozzles threadably assembled thereto interior of the upper leg member and in opposing relationship thereto along the interior of the respective vertical leg members thereof.

4,050,110

DUST PAN-PUSH BROOM APPARATUS

Gerard J. Donnelly, 151 Oakwood Drive, Wayne, N.J. 07470

Filed Sept. 14, 1976, Ser. No. 723,093
Int. Cl.[2] A47L *13/52*
U.S. Cl. 15—105 **5 Claims**



1. A dust pan comprising

a. a pan portion defined by a bottom wall, a pair of end walls and a rear wall, and having an open top and front,

b. the rear wall containing a centrally located aperture which opens through its upper margin and is sized to freely receive a push broom handle; and

c. a handle portion which includes a downwardly opening channel section which is joined to the pan portion solely by an upright connecting member which projects rearwardly from said rear wall and is positioned adjacent one side of said aperture,

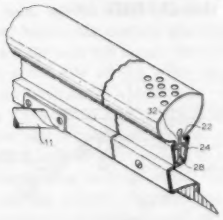
d. the channel section being axially aligned with said aperture, being sized to freely receive a push broom handle, and being spaced from said rear wall a distance greater than the diameter of a push broom handle.

4,050,111

WINDOW CLEANING DEVICE

George Raeburn Mallory, Blenheim, Canada, assignor to Mallory Hardware Products Limited, Blenheim, Canada

Filed Mar. 8, 1976, Ser. No. 664,571
Claims priority, application Canada, Mar. 2, 1976, 246987
Int. Cl.[2] A47L *1/08*
U.S. Cl. 15—232 **2 Claims**



1. In a window cleaning device of the type consisting of a handle, a head mounted on the handle, the head having a longitudinally elongated channel formed therein, the channel having an inner wall and oppositely disposed side walls, a flange on each of its oppositely disposed side walls projecting inwardly therefrom to form a narrow passage therebetween, a longitudinally elongated sponge having a longitudinally extending mounting portion and a longitudinally extending wiping portion, the mounting portion being mounted within said

channel to secure the sponge with respect to the head, the sponge having a slit formed in the mounting portion and extending into the wiping portion thereof to receive a stiffener, the improvement of a stiffener member formed from an elongated body of stiff material comprising

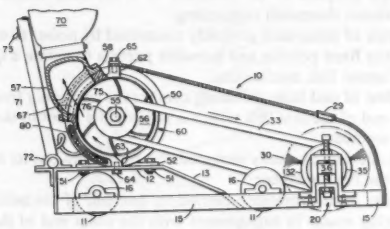
a. a pair of shoulders extending longitudinally of the body and projecting outwardly from the opposite sides of the body to divide the body into a spacer web on one side of the shoulders and a stiffener web on the other side thereof,
b. the shoulders having a combined width which is greater than the width of said narrow passage,
c. said stiffener member being located within said slit of said sponge with said shoulder portions thereof disposed within said channel in a face-to-face relationship with said flanges,
d. said spacer web projecting from said shoulders into engagement with the inner wall of said channel to prevent movement of the shoulders inwardly with respect to the channel such that the sponge is tightly clamped between the shoulders and the flanges, said stiffener web projecting outwardly from said channel to stiffen the wiping portions of the sponge, the stiffener being movable in a direction outwardly of the channel upon distortion of the sponge during use.

4,050,112

INDUSTRIAL FLOOR CLEANING MACHINE WITH VACUUM DUST COLLECTOR

Bernhard Saxon, 170 Concord St., Nashua, N.H. 03060

Filed June 14, 1976, Ser. No. 695,972
Int. Cl.[2] A47L *5/30, 5/34*
U.S. Cl. 15—300 A **5 Claims**



1. A floor-cleaning machine comprising:

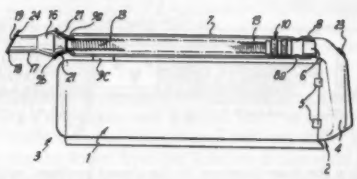
a. a housing, said housing being supported by wheels mounted to said housing and spacing said housing a fixed distance from a floor to be worked on;
b. a horizontally-positioned, elongated, cylindrical cleaning member in the forward part of said housing, the lower edge of said cleaning member extending through an opening in the bottom of said housing into a position to contact to said floor, a first shaft mounting said cylindrical cleaning member, a driven pulley on each side of said cylindrical cleaning member and affixed to said first shaft, a bearing on each side of said cleaning member mounting said first shaft for rotation, and a manually adjustable mounting means mounting each of said bearings to said housing, each mounting means having adjustable chocks holding said bearings and permitting setting of the spacing of said cylindrical cleaning member from said floor, said mounting means comprising upper and lower opposed vertically disposed threaded screws acting on such chocks; and
c. an electric motor driving unit mounted in said housing rearward of said cylindrical cleaning member, said driving unit having a drive shaft, an air impeller mounted to and driven by said drive shaft on each side of said driving unit and configured to expel air from said housing, a drive pulley mounted on each end of said drive shaft to the outside of said air impellers, a drive belt connecting said drive pulley to said driven pulley, and ducts guiding air flowing from said impellers to the exterior of said housing, said housing having a baffle plate for the bottom side thereof that is parallel to and spaced from said floor and supports said driving unit, the forward edge of said baffle plate ending in a downwardly directed ramp that guides debris and air flowing from said lower edge of said cylindrical cleaning member up towards said air impellers.

4,050,113

VACUUM CLEANERS

Gordon Thomas Wright, 55 Windemere Avenue, Burnley, Lancashire, England, and Eric George Doubleday, am Kraherwald 167, D-7000 Stuttgart-West, Germany

Filed Jan. 21, 1976, Ser. No. 650,967
Claims priority, application United Kingdom, Jan. 24, 1975, 3287/75
Int. Cl.[2] A47L *9/00*
U.S. Cl. 15—315 **5 Claims**



1. A vacuum cleaning apparatus of the kind comprising a suction device connected to a suction inlet and to a filtration device whereby contaminated fluid can be drawn through said inlet and passed through said filtration device to remove contaminants therefrom, said apparatus having:

an elongated chamber having first and second ends, said first end being connected to said suction inlet;
a resiliently extensible and contractable flexible hose self-biased to an extended state having first and second ends, said first end of the hose being held captive within said chamber and in sealed communication with the first end of the chamber and said second end of the hose being extendable beyond the outlet end of the chamber and being adapted for detachable attachment of a contaminated fluid pick-up tool thereto; cooperating retention means on the second end of the chamber and on the second end of the hose for releasably holding the second end of hose in retracted position at the second end of the chamber against said self-bias;
and closure means at said second end of the hose which is opened on connection of said tool to said second end and which can be closed to seal the hose on detachment of the tool;
whereby on release of said retention means and opening of said closure means the hose is extended from the chamber in response to the extensive self-bias thereof and on closure of said closure means the hose is contracted and drawn back into said chamber by suction from the suction device overcoming said extensive self-bias to be held therein by the retention means.

4,050,114

DOOR CLOSER ASSEMBLY

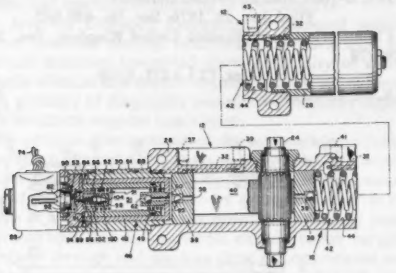
Richard L. Zunkel, Marshville, N.C., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 30, 1976, Ser. No. 718,493
Int. Cl.[2] E05F *15/20*
U.S. Cl. 16—48.5 **23 Claims**

1. A door closer hold open assembly connectable to a door for closing the door in response to a control signal comprising,

a housing, a linkage assembly connectable to the door to transmit door movement from a closed position to an open

position, biasing means providing a restoring force to move the door to the closed position, a main piston assembly disposed in said housing and actuatable by said linkage assembly to move said main piston assembly against the force of said biasing means as the door moves from said closed position, a fluid chamber disposed in said housing and having fluid disposed therein for exerting a force on said main piston to balance the force of said biasing means in any desired door position to maintain said main piston in the position it was last moved to by said linkage assembly, and release means for releasing the fluid disposed in said chamber to dissipate the balancing force of said fluid to



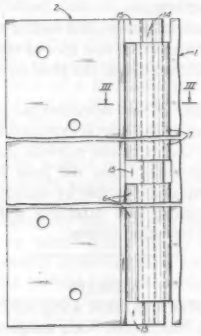
allow the door to return to the closed position, said release means including first and second valve means disposed in a parallel circuit each of which is independently operable to control the flow of fluid from said chamber, said first valve means being electrically controlled from a closed position prohibiting flow therethrough from said chamber to an open position providing flow therethrough from said chamber, said second valve means being resiliently biased toward a closed position prohibiting fluid flow therethrough from said chamber and being operable upon a predetermined increase in the fluid pressure in said chamber to open against said resilient biasing force and provide for fluid flow therethrough from said chamber.

4,050,115

DOOR HINGE

Joseph W. Gwozdz, Clark Summit, Pa., assignor to McKinney Manufacturing Company, Scranton, Pa.

Filed Oct. 14, 1976, Ser. No. 732,353
Int. Cl.[2] E05D *9/00, 15/00*
U.S. Cl. 16—128 R **10 Claims**



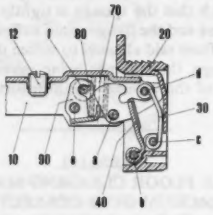
1. A door hinge comprising a pair of parallel hinge leaves adapted to be fastened to a door and a door jamb, an integral open outer loop extending along one edge of one of the leaves, and integral inner loop extending along one edge of the other leaf and disposed inside said outer loop, a hinge pin extending through said inner loop in engagement therewith and having longitudinally spaced exposed areas, and spacing members rigidly mounted in said outer loop and encircling said exposed areas of the hinge pin in engagement therewith to hold the pin in predetermined position in the outer loop, and the opposed surfaces of the two loops being held apart by said pin and spacing members to prevent the loops from rubbing together when the hinge is opened and closed.

4,050,116

SELF-CLOSING HINGE

Luciano Salice, Carimate (Como), Italy, assignor to S.A.R. L. Salice France, Nice, France

Filed Jan. 7, 1976, Ser. No. 646,991
Claims priority, application France, Jan. 20, 1975, 75.01671
Int. Cl.[2] E05D *3/06*
U.S. Cl. 16—163 **7 Claims**



1. A self-closing hinge mechanism having a fixed portion adapted to be mounted to a fixed member and a movable portion adapted to be mounted to a movable member for movement therewith comprising:

a pair of links, each pivotally connected by points to each of the fixed portion and movable portion to define a quadrilateral link mechanism;

a first of said links including cam means extending from that end of the first link which is adjacent its pivot to the fixed member;

a bellcrank pivotally mounted at a point between its ends to the fixed member;

roller means rotatably carried by one end of the bellcrank;

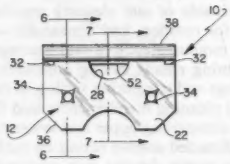
spring means in engagement with the other end of the bellcrank to bias the bellcrank in a direction which will cause engagement of the roller means with the cam means.

4,050,117

EASEL HINGE CONSTRUCTION

Leo T. Roy, South Attleboro, Mass., assignor to Craft, Inc., South Attleboro, Mass.

Filed Sept. 7, 1976, Ser. No. 721,177
Int. Cl.[2] E05D *1/04*
U.S. Cl. 16—178 **10 Claims**



1. An easel hinge comprising an outer hinge plate and an inner hinge plate directly interconnected to each other for relative arcuate movement therebetween without a hinge pin, said outer hinge plate having a relatively flat leaf portion terminating in a curled barrel at one end thereof, said inner hinge plate also having a relatively flat leaf portion terminating

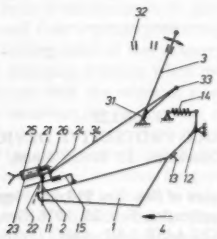
in a curled barrel at one end thereof, said inner hinge leaf portion having at least one opening therethrough, said opening adjacent to and disposed longitudinally of said inner barrel, said outer barrel terminating in a longitudinal free edge directed towards the inner side of said outer leaf and having at least one portion thereof proximate said inner side to define a closed barrel portion, the remaining portions thereof spaced from said inner side to define an open barrel portion, said closed barrel portion being aligned with and projecting through said inner leaf opening and generally completely enveloping portions of said inner barrel positioned therewithin, while permitting relative rotational movement therewith and preventing longitudinal movement of said plates with respect to each other, such respective barrel positioning also permitting angular separation between said plates from a fully closed position wherein the inner sides of said leaves are face-to-face to a fully open position wherein the outer side of said inner leaf abuts the longitudinal free edge of said outer barrel open portion.

4,050,118

FISH PROCESSING MACHINES

Werner Wenzel, Lubeck, Germany, assignor to Nordischer Maschinenbau Rud. Baader, Lubeck, Germany

Filed Apr. 8, 1976, Ser. No. 674,839
Int. Cl.[2] A22C *25/00*
U.S. Cl. 17—54 **6 Claims**



1. A device for controlling a tool of a fish processing machine in which fish are fed along a feed path, said device comprising

control means for generating a signal to control said tool,

a first sensing element pivotably mounted on said machine and positioned along said feed path for pivotal displacement in response to engagement with a fish fed along said feed path,

a second sensing element operatively coupled to said control means for actuating the latter to generate said signal,

carrier means movably mounted on said first sensing element, with said control means immovably mounted on said carrier means and said second sensing element movably mounted on said carrier means,

said second sensing element being positioned to engage said fish downstream of said first sensing element for movement of said second sensing element relative to said control means in a direction to actuate said control means,

actuating means for displacing said carrier means on said first sensing element in response to the pivotal displacement of said first sensing element and in a preset proportionality ratio to the extent of said pivotal displacement of said first sensing element, whereby to vary the position of said second sensing element relative to said first setting element in accordance with the size of the fish sensed by said first sensing element,

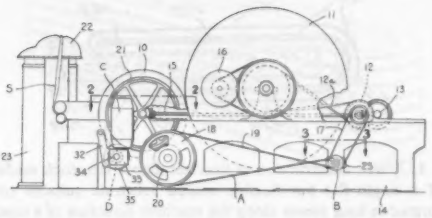
and adjustment means to vary the setting of said proportionality ratio.

4,050,119

TEXTILE CARDING MACHINE OPERATING SYSTEM AND METHOD

Joseph L. Freeman, Greenville, S.C., assignor to John D. Hollingsworth on Wheels, Inc., Greenville, S.C.

Filed Jan. 31, 1977, Ser. No. 763,965
Int. Cl.[2] D01G *15/46*
U.S. Cl. 19—106 R **7 Claims**



1. An operating system for a textile card having a doffer gear for driving a doffer gear and a driven licker-in comprising:

drive means between said licker-in and said doffer gear for driving the doffer from the licker-in at operating speed;

means for engaging and disengaging the drive means;

a direct current motor for driving said doffer gear when said drive means is disengaged;

means for engaging and disengaging said direct current motor with said doffer gear; and

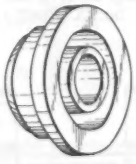
control means for engaging said drive means and de-energizing the direct current motor when said direct current motor has returned the doffer to operating speed.

4,050,120

FASTENER

Takehisa Yamaguchi, Yokohama, Japan, assignor to Kato Hatsujyo Co., Ltd., Japan

Filed Apr. 5, 1976, Ser. No. 674,031
Claims priority, application Japan, Dec. 9, 1975, 50-165288[U]
Int. Cl.[2] A44B *21/00*
U.S. Cl. 24—73 HS **5 Claims**

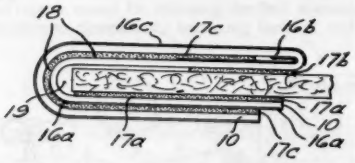


1. A fastener integrally formed of a flexible material comprising a tubular base portion, a tubular inner portion formed within the base portion, and a connecting portion connecting the base portion with the inner portion, the spacing between the inner portion and the base portion being substantially uniform, the connecting portion having at its center an opening for receiving a projected leg member therethrough, the top of the inner portion being formed with an opening in alignment with the opening in the connecting portion, and a peripheral flange extending outwardly from the top of said base portion.

4,050,121
SINGLE SUBSTRATE TAB FASTENER

Edward B. Richman, Shaker Heights, Ohio, assignor to Avery International Corporation, San Marino, Calif.

Filed Jan. 10, 1977, Ser. No. 757,910
Int. Cl.[2] A44B 21/00
U.S. Cl. 24—73 VA 8 Claims

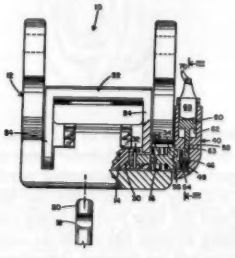


1. A web construction of linerless diaper tab stock made up of a single flat but flexible coated substrate suitable to be formed in long passes along the machine direction of a coating and laminating line and to be rolled up for storage and shipment, and unrolled for use by diaper manufacturers, and fabricatable completely by web coating and slitting operations and without the necessity for laminating or folding operations, and suitable for high speed dispensing on automatic equipment, including a substrate extending, transversely to machine direction, along first, second, third, fourth and fifth endwise length portions, said first and third length portions including adhesive on the top side of the substrate and release means on the bottom side, said second length portion having no release means on the bottom side of the substrate to thereby define an anchoring portion where release means is absent, said fourth length portion being sufficiently wide for the bottom side of the substrate at the fourth length portion to be folded across said third length portion and reach and at least partially cross said anchoring portion, said fourth length portion having adhesive on the bottom side of the substrate and release means on the top of the substrate at at least the part of the fourth length portion which is capable of crossing said anchoring portion when said fourth length portion is so folded, said fifth length portion including adhesive and release means on opposite sides of the substrate.

4,050,122
SIDE-MOUNTED AUTOMATIC POWER RELEASE ATTACHMENT FOR MANUAL CONNECTORS

James Wesley Turner, deceased, late of El Centro, Calif., by Thomas M. Helm, executor, and Ray E. Spinks, El Centro, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 25, 1975, Ser. No. 607,316
Int. Cl.[2] B64D 17/32
U.S. Cl. 24—230 A 8 Claims



8. A quick-release connector comprising:

a male connector half fitting having at least one longitudinally extending prong having a recess at its free end;

a female connector half fitting having at least one longitudinal opening to receive said prong;

a shaft rotatably mounted transversely in said female fitting and engageable with the recess in said prong for releasably locking together said connector fittings;

said female fitting having a side opening through which an end of said rotatable shaft is accessible;

manual lever means for actuating the rotatable shaft to disengage said prong to permit the fittings to be separated;

said connector having a housing on one side of the female fitting provided with a transverse opening adjacent to and aligned with said side opening in the female fitting;

said housing having a cylinder;

a piston slidably mounted in the cylinder in a direction normal to said side opening;

a fluid power source for driving the piston;

a driving member rotatably mounted in said housing adjacent to said side opening and connected to the end of said rotatable shaft;

said driving member being aligned with the piston and engageable thereby for rotation;

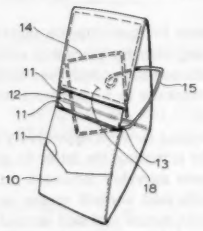
whereby activation of the power source will cause the piston through said driving member to rotate the shaft and unlock said fittings;

said driving member having means for securing the rotatable shaft and the connector in the unlocked position.

4,050,123
BILLFOLD PROTECTIVE DEVICE

Charles Lindberg Okerblom, 20 Welch Road, Warwick, R.I. 02889

Continuation-in-part of Ser. No. 510,699, Sept. 30, 1974, abandoned. This application Feb. 25, 1976, Ser. No. 611,637
Int. Cl.[2] A45F 5/02; A45C 13/18
U.S. Cl. 24—3 D 5 Claims

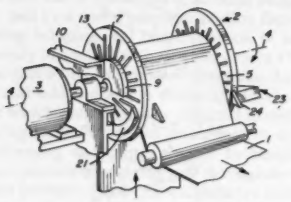


1. An accidental loss or theft preventing guard which is readily insertable or removable from a card pocket or unused pocket behind said card pocket formed by the center partition and the card pocket material fold of a center folding trouser pocket billfold comprising: a single strand of bendably resilient wire consisting of a straight portion forming one side of a frame, a second portion bent at 90° to form a second side, substantially level, a third portion bent back at 90° to form a third side of the rectangular frame, a fourth portion bent back at 90° to complete the rectangular frame, a fifth portion bent back at approximately 45° and having some curvature such that it is essentially diagonal and then parallel to said frame, and a sixth portion bent back towards said frame and overlapping said frame and ending in a loop.

4,050,124
WEB STRETCHING APPARATUS

Clive D. Barnsbee, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 30, 1975, Ser. No. 600,667
Int. Cl.[2] D06C *3/00*; B29D *7/24*
U.S. Cl. 26—73 9 Claims



1. An apparatus for stretching a web in which longitudinal stretching of the web is accomplished comprising:

a pair of spaced apart rotatable members each having an axis of rotation;

means for rotating said members in unison about their axes of rotation;

a plurality of angularly spaced primary clamps carried and guided by each of said members for generally radial movement outward from a primary web engaging position;

means for actuating each of said primary clamps at its primary web engaging position when moved into overlapping alignment with the edges of a web transported between said members for successively engaging the edges of the web;

a plurality of angularly spaced secondary clamps carried and guided by each of said members for generally radial movement outward from a secondary web engaging position radially spaced from said primary web engaging position, said secondary clamps being angularly interposed between said primary clamps;

means for actuating each of said secondary clamps at its secondary web engaging position when moved into overlapping alignment with the intermediate edges of the web extending between a pair of web engaged primary clamps for successively engaging the intermediate edges of the web;

a stationary cam associated with each of said members and adapted upon rotation of said members to successively contact and cam (1) each of said primary clamps radially outwardly from its primary web engaging position whereupon initial stretching of the web takes place, and (2) each of said secondary clamps radially outwardly from its secondary web engaging position whereby continued stretching of the web occurs with minimum scalloping of the web edge,

each of said primary clamps being actuated at a primary web disengaging position for successively disengaging the edges of the web,

means operative in response to rotation of said members to return said primary clamps after disengagement to their primary web engaging positions,

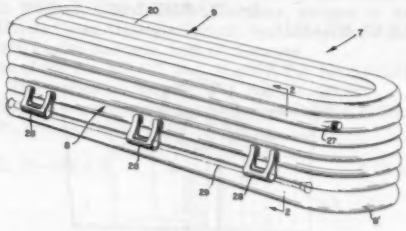
each of said secondary clamps being actuated at a secondary web disengaging position for successively disengaging the intermediate edges of the web, and

means operative in response to rotation of said members to return said secondary clamps after disengagement to their secondary web engaging positions.

4,050,125
INFLATED CASKET

Clifford B. Malbon, 2140 Palmetto Ave., Apt. No. 1, South Daytona, Fla. 32019

Filed June 17, 1976, Ser. No. 696,833
Int. Cl.[2] A61G *17/00*
U.S. Cl. 27—2 9 Claims

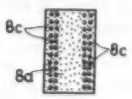


1. A casket comprising a body and a cover each formed in part of a hollow inflatable material, said body comprising a bottom and an upstanding surrounding wall including at least one inflated chamber by which said wall is supported, said bottom and wall defining the interior of the casket, said cover having a marginal portion engaging an upper surface of said surrounding wall, and means sealing the connection between said marginal portion of the cover and said surrounding wall to provide a hermetic seal for the chamber defined by the casket.

4,050,126
METHOD FOR ADJUSTING FREQUENCY-TEMPERATURE CHARACTERISTIC OF GT CUT QUARTZ OSCILLATOR

Hitoshi Ikeno, Koganei; Mitsuyuki Sugita, Ichikawa, and Hirofumi Yanagi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Seikosha, Japan

Filed Sept. 9, 1976, Ser. No. 721,783
Claims priority, application Japan, Sept. 10, 1975, 50-109803
Int. Cl.[2] H01L *41/22*
U.S. Cl. 29—25.35 6 Claims

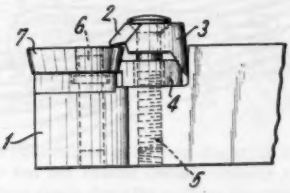


1. A method of adjusting the frequency-temperature coefficient and the frequency of a GT cut quartz oscillator which comprises providing a GT cut quartz crystal blank of approximately the frequency desired, depositing an electrode film on front and rear faces of said blank, adjusting the side ratio between a longer side and a shorter side of said blank while measuring the frequency-temperature coefficient of said blank to obtain a zero frequency-temperature coefficient and thereafter adjusting the area of said electrode film on said blank to obtain the desired frequency without changing said side ratio of said blank and thus without disturbing said zero frequency-temperature coefficient.

4,050,127
CLAMPING TOOL HOLDER

Johann Bodem, Reutte, Austria, and Thomas Raine, Stockport, England, assignors to Schwarzkopf Development Corporation, New York, N.Y.

Filed Nov. 19, 1976, Ser. No. 743,503
Claims priority, application Austria, Nov. 21, 1975, 8865/75; Feb. 6, 1976, 850/76
Int. Cl.² B26D 1/00
U.S. Cl. 407—107 7 Claims

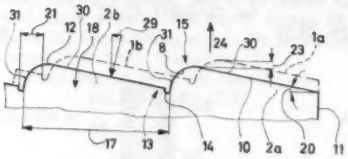


1. A clamping tool holder comprising a tool shank equipped on its front end with a stepped recess, into the horizontal frontal lower face of which there is set a pin, on which a disposable pin-type cutting insert is placed, and from the rear upper face of which a screw thread extends into the shaft, in which a clamping screw is inserted which passes through a clamp; wherein a positioning block is located below the clamp which is slidably arranged in relation to said clamp, and which is fitted with an oblong hole, through which said clamping screw extends, and elements having a wedging action on the clamp and positioning block and rear wall of the shank recess, by means of which a clamping of the positioning block against one or more lateral faces of the disposable cutting insert is effected.

4,050,128
MILLING CUTTER

Klaus Lange, Vaihingen, Enz, Germany, assignor to Biax-Werkzeuge K.G. Wezel & Co. Prazisionswerkzeug-Fabrik, Maulbronn, Germany

Filed June 29, 1976, Ser. No. 700,961
Claims priority, application Germany, July 24, 1975, 2533079
Int. Cl.² B26D 1/12
U.S. Cl. 407—59 10 Claims

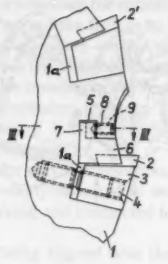


1. A milling cutter rotatable about a central axis in a predetermined rotational sense and having an axially extending shaft adapted to be held in a chuck and a plurality of helical blades separated by helical flutes and each formed as a row of teeth each having an axially directed end flank turned toward said shaft and a radially outwardly turned side flank, each of said side flanks being inclined toward said axis away from said shaft from a high end at the respective end flank to a low end, each of said teeth further being formed with a rounded chamfer at said high end and between said flanks, each of said rows of teeth being axially offset from the circumferentially flanking rows with the rounded chamfers of each row being aligned circumferentially relative to said sense behind the respective low ends of the row in front.

4,050,129
MILLING CUTTER

Willi Jester, Herten-Westerholt, and Hans Tack, Heiligenhaus, both of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed June 1, 1976, Ser. No. 691,445
Claims priority, application Germany, June 12, 1975, 2526345
Int. Cl.² B26D 1/12
U.S. Cl. 407—45 7 Claims



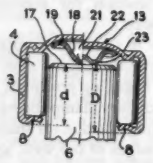
1. In a milling cutter including a disc-shaped cutter body having an axis; means defining a plurality of circumferentially spaced openings provided in the periphery of the cutter body; a separate stop received in each opening of the cutter body; a cutter blade received in each stop and being axially adjustable therewith; and a separate wedge member received in each opening of the cutter for tightening each cutter blade to the respective stop; the improvement comprising

a. means defining a recess forming a generally circumferentially oriented extension of each said opening;
b. a projection attached to and extending from each stop at an angle of 90° with respect thereto; said projection being received in the respective recess;
c. at least two axially oriented clamping faces forming part of each said projection; said clamping faces being inclined with respect to one another; and
d. a separate set screw cooperating with each clamping face; each set screw being supported in said cutter body in a substantially radial orientation with respect to said axis and protruding into the respective recess; each clamping face being obliquely disposed with respect to the orientation of the associated set screw for effecting an axial shift of said stop upon tightening the respective set screw.

4,050,130
METHOD FOR MOUNTING A BEARING IN A UNIVERSAL JOINT

Alfred Pitner, Paris, France, assignor to Nadella, France, a part interest

Filed Aug. 20, 1974, Ser. No. 499,011
Claims priority, application France, Aug. 23, 1973, 73.30579; Dec. 28, 1973, 73.47062
Int. Cl.² B21D 53/10
U.S. Cl. 29—149.5 R 2 Claims



1. In a method for mounting a cylindrical bearing around a

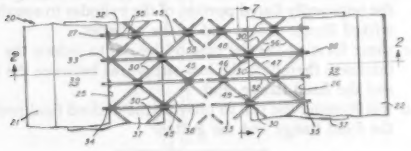
trunnion having an end face of a cross member of a universal joint, the cylindrical bearing being open at one end and closed by an end wall at the other end of the bearing, by fitting the bearing in a bore of a corresponding yoke of the joint so that, in a final position of the bearing in said bore, the end wall of the bearing affords an elastic support for said end face of the trunnion, the end wall having a center portion which initially forms a depression having a convex side facing said end face and which, by the effect of plastic deformation, has its profile inverted resulting in a dome which has a concave side facing said end face and is connected to an outer peripheral portion of the end wall by a convex annular portion facing said end face, comprising bringing said center portion of said end wall initially merely in contact with said end face in a first stage of said fitting so that a first axial distance between the open end of the bearing and said end face is distinctly less than a second axial distance which must be finally obtained in said final postion of the bearing in said bore; the improvement comprising plastically deforming said center portion by plastically displacing the center portion of said end wall throughout the thickness of the center portion of said end wall relative to the outer peripheral portion of said end wall axially of the bearing by applying a force on said outer peripheral portion said said end face of the trunnion exerting a reaction on said center portion so that said end wall is made to bend in all diametral planes of said end wall by urging the bearing still further into said bore in a final stage of said fitting so as to eliminate the difference between said first and second axial distances and invert said profile and produce said dome and make said end face bear against said convex annular portion and thereby achieve the required elastically yieldable support under the effect of plastic partial return consecutive to said plastic deformation of said center portion.

4,050,131

ROLL WITH INNER AND OUTER, SPACED AXIALLY EXTENDING TRIANGULAR MESH STRIPS

Edward T. Bryand, Saco, Maine, assignor to Honeycomb Systems, Inc., Biddeford, Maine

Filed Dec. 6, 1976, Ser. No. 747,607
Int. Cl.² D21F *3/10*
U.S. Cl. 29—121.3 **11 Claims**



1. A roll comprising

a pair of shaft-supported, end rings each having an inner peripheral face with a plurality of radial grooves spaced therearound and

an elongated hollow cylindrical grid-like shell said shell having:

a plurality of straight, wide, thin, planar, strips, each extending axially of said roll, each opposite end of alternate straight strips being seated in one of the radial grooves in said end rings and said strips having inner, intermediate and outer portions,

and a plurality of pairs of undulated, narrow, thin strips, one strip of each pair extending axially of said roll between the opposite inner portions of each adjacent pair of said straight strips, the other strip of each pair extending axially of said roll between the opposite outer portions of each said adjacent pair of said straight strips, and the intermediate portions of said straight strips being free of any undulated strips,

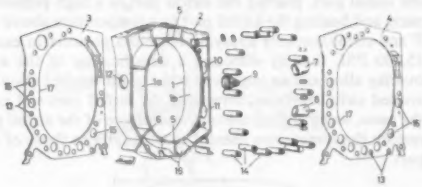
said undulated strips having V-shaped undulations with sharp apex portions, each said apex portion being cut away for at least half its width and said undulated strips being interconnected with said straight strips at said sharp, cut away, apex portions to form triangular shaped open mesh therewith.

4,050,132

METHOD OF PRODUCING A HOUSING FOR CIRCULAR PISTON COMBUSTION ENGINE OF TROCHOID TYPE

Werner Wieland, Obereisesheim, Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm and Wankel GmbH, Lindau Bodensee, both of Germany

Division of Ser. No. 427,417, Dec. 21, 1973, Pat. No. 3,942,917. This application Nov. 28, 1975, Ser. No. 635,950
Claims priority, application Germany, Dec. 21, 1972, 2262620; June 30, 1973, 2333364
Int. Cl.² B23P *17/00*
U.S. Cl. 29—156.4 R **6 Claims**



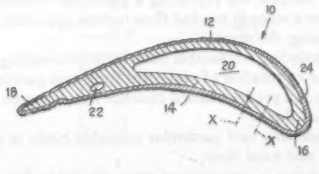
1. A method for producing the annular shell of a housing for a rotary combustion engine of trochoid type said shell comprising an inner peripheral wall in the shape of a multi-arcuate trochoid, an outer peripheral wall and two end walls parallel to each other, spacers between the inner and outer peripheral walls and at least one insert to accommodate a sparkplug, and lengths of pipes between the end walls for accommodating through bolts, comprising the following steps; accurately punching out from sheet steel said spacers and said walls with all openings for accomodating said pipes and insert, cutting said lengths of pipes, forming said insert, forming the inner and outer peripheral walls by bending the respective sheet steel parts, tack welding said spacers and insert between said inner and outer peripheral walls and tack welding said inner and outer peripheral walls as well as said lengths of pipes to one end wall in such a way that a soldering gap is left between these parts, applying a solder in paste form at the points of contact, adding the second end wall, soldering all parts together in a soldering furnace and finally plane-grinding the outer faces of the end walls.

4,050,133

METHOD OF REFURBISHING TURBINE VANES AND THE LIKE

Salvatore J. Cretella, 180 Fitch St., North Haven, Conn. 06473; Matthew Bernardo, 62 Lee St., West Haven, Conn. 06516, and Ralph T. DeMusis, 547 Foxon Road, North Branford, Conn. 06473

Filed June 7, 1976, Ser. No. 693,640
Int. Cl.² B23P *7/00*; B 23 P 1502
U.S. Cl. 29—156.8 B **14 Claims**



1. The method of refurbishing an airfoil-shaped metal alloy

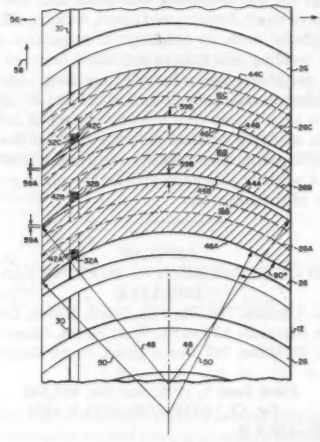
turbine part having a composition containing substantial quantities of cobalt, chromium, tungsten and nickel, with silicon present in an amount less than several percent, comprising the steps of mixing a preparation of an overlay metal alloy comprising substantially the same respective amounts of cobalt, chromium, tungsten and nickel as contained in said turbine part and with silicon present in an amount less than several percent, adding to said preparation an amount of silicon equal to essentially at least ten percent of the silicon content of the preparation, converting said preparation and added silicon into a molten alloy, applying said molten alloy to the eroded surfaces of the airfoil part to build-up the same beyond its original surface, sintering the airfoil part in a furnace at a temperature above 2,000° F and burning off substantially all of the added silicon contained in the molten alloy that was applied to said part such that the resultant overlay alloy has substantially the same composition as the turbine part, removing and cooling the airfoil part, placing the airfoil part in a high pressure furnace, and heating the airfoil part to a temperature above 2,000° F and simultaneously applying thereto a pressure in excess of 15,000 PSI, thereby effecting a densification of the applied overlay alloy and an improved bond of the applied alloy to the eroded airfoil surfaces, removing the airfoil part and cooling the same, and grinding the overlay surface of the airfoil part to restore the dimensions thereof substantially to those of a new part.

4,050,134

METHOD FOR REMOVING ROTATABLE BLADES WITHOUT REMOVING THE CASTING OF A TURBINE

Ronald E. Warner, Media; Francis J. Healey, Ridley Park, and Abel D. Grijalba, Swarthmore, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 518,909, Oct. 29, 1974, Pat. No. 3,986,793.
This application July 2, 1976, Ser. No. 702,258
Int. Cl.² B23P *15/04, 7/00*
U.S. Cl. 29—156.8 R **10 Claims**



1. A method for replacing a particular rotatable blade disposed on a rotor in an axial flow turbine apparatus, said method comprising the steps of

a. displacing a rotatable blade next proceeding in the direction of rotation of said rotor from said particular rotatable blade a predetermined distance in a direction opposite said axial flow,

b. removing said particular rotatable blade in said direction of said axial flow,

c. moving a replacement rotatable blade for said removed particular rotatable blade into said turbine apparatus in said direction opposite said axial flow, and,

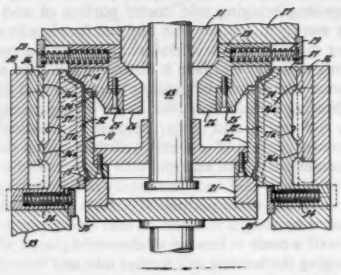
d. returning said displaced rotatable blade to its original position.

4,050,135

FLAT BASE TRUCK RIM FORMING SYSTEM

Hans R. Luedi, Highland Park, Ill., assignor to Grotnes Machine Works, Inc., Chicago, Ill.

Filed July 11, 1975, Ser. No. 595,064
Int. Cl.² B21K *1/38*
U.S. Cl. 29—159.1 **13 Claims**



1. A method of forming a flat base truck rim from a flat strip of hot rolled, rimmed, low carbon steel rolled into the form of a smooth cylinder and welded together along the abutting axial edges, said method comprising the steps of

a. advancing a plurality of dies located at opposite ends of the cylinder relatively toward each other in the direction of the cylinder axis to flare a first end of the cylinder radially outwardly while rough forming a rim gutter on the other end of the cylinder, increasing the radial thickness of the metal forming the rim gutter during the rough forming thereof by applying a compressive axial load to the cylinder and providing a gutter-forming die cavity wider than the starting thickness of the cylinder,

b. radially shifting the flaring die at said first end of the cylinder and again advancing said dies relatively toward each other in the direction of the cylinder axis to deform the outwardly flared portion of the cylinder to rough form a fixed flange at that end of the cylinder,

c. shear forming the flat base of the rim to reduce the radial thickness thereof in the low stress area between the gutter and the fixed flange, and

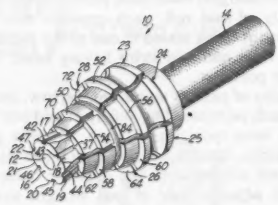
d. roll forming the rim to provide the desired final profile in the fixed flange and the gutter.

4,050,136

BEARING RACE DRIVER

William E. Shultz, 239 N. Main St., Lombard, Ill. 60148

Filed Feb. 10, 1976, Ser. No. 656,781
Int. Cl.² B21D *53/10*; B23P *19/04*
U.S. Cl. 29—724 **8 Claims**



1. A tool for inserting bearings comprising a plurality of expandable segments, a shaft having a cam means attached thereto, said cam means including means for expanding each of said expandable segments radially outwardly from said shaft, each of said expandable segments having a first bearing drive

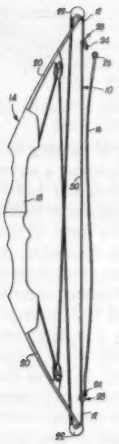
shoulder and a second bearing drive shoulder, said second bearing drive shoulder disposed at a greater radial distance from a longitudinal axis of said shaft than said first radial drive shoulder, wherein said first bearing drive shoulders of said expandable segments form a first substantially flat annular drive surface lying in a plane substantially perpendicular to the longitudinal axis of said shaft, and said second bearing drive shoulders of said expandable segments form a second substantially flat annular drive surface lying in a plane substantially perpendicular to the longitudinal axis of said shaft, said second annular drive surface disposed at a greater radial disance from said longitudinal axis of said shaft than said first annular drive surface, said first and second annular drive surfaces capable of abuting bearing races of different diameters.

4,050,137

BOWSTRING CHANGER CABLE FITTING

John A. Carlson, Wichita, Kans., assignor to Conchemco, Incorporated, Lenexa, Kans.

Filed Mar. 15, 1976, Ser. No. 666,580
Int. Cl.[2] B23P *19/02*
U.S. Cl. 29—235 5 Claims



1. A bowstring changer for use with a compound bow of the type having the bowstring normally stretched between two oppositely biased tension cables and releasably coupled at opposite ends to the cables, said changer including:

a pair of normally spaced, substantially tubular members each having a generally cylindrical passage and a generally axially extending slot formed in the wall of said member,

each said slot being in communication with the passage for permitting selective placement of the tubular member around a respective tension cable,

each of said members having a face at one end of their respective passages for abutting against a holder on respective ends of each tension cable when the changer is positioned to join the cables; and

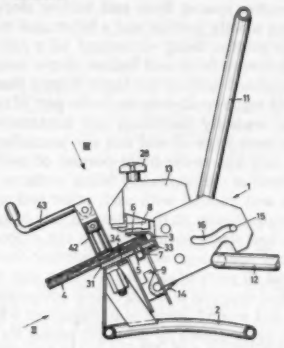
means for connecting and limiting the maximum spacing between said members to a predetermined distance, said last mentioned means, when connected to tension caables, permitting a strung bowstring to be removed from holders on the ends of the tension cables.

4,050,138

APPARATUS FOR ATTACHING CONNECTORS TO THE ENDS OF A CONVEYOR BELT

Hermann Stolz, Mulheim am Main, Germany, assignor to MATO Maschinen- und Metallwarenfabrik Curt Matthaei GmbH & Co. KG, Offenbach am Main, Germany

Filed Oct. 4, 1976, Ser. No. 729,397
Claims priority, application Germany, Oct. 10, 1975, 2545401; Oct. 10, 1975, 2545402; Oct. 10, 1975, 2545403
Int. Cl.[2] B23P *11/00*
U.S. Cl. 29—243.51 12 Claims



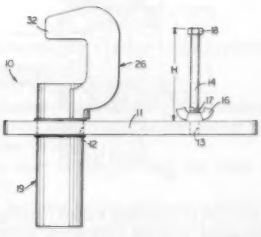
1. An apparatus for attaching connector means to the ends of a conveyor belt and for anchoring said connector means by securing elements, comprising frame means, clamping means including pressure applying upper and lower jaw means, a counter motion actuating lever mechanism supported on said frame means, said upper and lower jaw means being operatively connected to said counter motion lever mechanism for intermittently closing and opening said pressure applying upper and lower jaw means, said apparatus further comprising bending tool means, operatively connecting said bending tool means to said actuating lever mechanism for operating the bending tool means subsequently to the actuation of said upper and lower jaw means and in a direction extending perpendicularly to the direction of pressure application by said jaw means, said bending tool means being arranged on that side of said conveyor belt on which the free ends of said securing elements protrude from said conveyor belt whereby said free ends of the securing elements are bent over.

4,050,139

PISTON PIN INSTALLING AND REMOVING APPARATUS

James A. Okamuro, Kalamazoo, Mich., assignor to Borroughs Tool & Equipment Corporation, Kalamazoo, Mich.

Filed June 22, 1976, Ser. No. 698,671
Int. Cl.[2] B23Q *1/00*
U.S. Cl. 29—283 7 Claims



1. A component for use in a piston pin remover and replacer device for assembling and disassembling the piston pin connec-

tion between a connecting rod and a piston head, said piston head having spaced walls which each have a first opening therein aligned with the other first opening, wherein said connecting rod has an end having a second opening therein adapted to receive said piston pin therein and wherein a clearance space exists between said end and said spaced walls of said piston head which have said aligned first openings therein, said component comprising:

base means;

a hollow sleeve member mounted on said base and having an opening therein; and

an anvil member spaced from said hollow sleeve member and having a body portion and a bifurcated portion, said bifurcated portion being comprised of a pair of spaced apart legs spaced from said hollow sleeve member;

a rim of predefined uniform thickness thinner than the thickness of said legs mounted on the inside part of said legs and extending inwardly therefrom and coextensively therewith, the inner edge of said rim also extending in an arc between said legs at the bight portion of said bifurcated portion, both of the oppositely facing surfaces on said rim being flat and parallel with each other and contained in planes perpendicular to the extended axis of said opening in said hollow sleeve member which axis extends between said spaced apart legs and is equidistant from said rim throughout all parts of said arc whereby said rim directly engages and supports said end of said connecting rod with said first and second openings in alignment when a piston pin is forceably driven by drive pin means for movement relative to said end and said piston head to effect one of a removal and a replacement of said piston pin between said connecting rod and piston head; and

an arbor member reciprocally and slidably movable in said hollow sleeve member, stop means in said hollow sleeve member, resilient means for resiliently urging said arbor member away from said stop means and out of said hollow sleeve member, said arbor member having a diameter accommodating reception in said aligned first and second openings whereby said arbor member is urged toward said stop means in response to an engagement with a piston pin moving relative to said connecting rod and piston head during assembly, said arbor member having a sufficient length to engage said stop means and simultaneously limit the extent of travel of said piston pin.

4,050,140

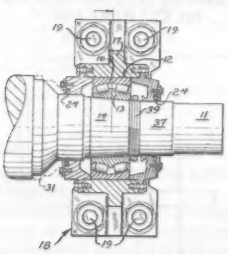
BEARING HOUSING ADAPTABLE TO REWORKED SHAFT BY REVERSAL METHOD OF REPAIR

Robert Keith Newell, Cedar Rapids, Iowa, assignor to Pettibone Corporation, Chicago, Ill.

Division of Ser. No. 472,303, May 22, 1974, Pat. No. 3,940,188. This application Nov. 28, 1975, Ser. No. 636,064

Int. Cl.² B23P 7/00

U.S. Cl. 29—401 B 3 Claims



1. The method of repairing a shaft (having at one end portion surface-damaged bearing-contoured portions of increasing diameters inwardly from the shaft end) including the steps of reworking the original metal of the shaft by removing surface metal to provide new bearing-contoured surfaces relocated inwardly from the original bearing-contoured surfaces, and reversing parts of a bearing housing through which the shaft extends, and which has its bearing chamber located axially out of symmetry in relation to its securing formations which determine its axial position, to provide a matching inward shift of its bearing chamber.

4,050,141

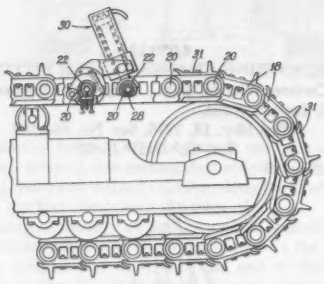
TRACK BUSH TURNING TOOL

Harold W. Vanlandingham, Washington; Roger L. Boggs; David A. Bullock, both of East Peoria, all of Ill., and James N. Maytum, Waverly, Iowa, assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 617,346, Sept. 29, 1975, abandoned, which is a division of Ser. No. 348,886, April 9, 1973, Pat. No. 3,915,036. This application Dec. 29, 1976, Ser. No. 755,412

Int. Cl.² B23P 7/00

U.S. Cl. 29—401 R 5 Claims



1. A method of rotating a bushing of an assembled and in-place track of a tractor including a series of interconnected track links having track shoes and end supported bushings associated therewith, to define a new bushing sprocket engaging area by applying rotative force to the bushing with the track in its substantially assembled state, comprising the steps of disposing a bushing engaging tool about the periphery of the unsupported portion of the bushing, securing the tool in place, providing an opening in said tool corresponding to the worn part of said bushing, placing a wedging member in said opening in engagement with said worn portion for locking the bushing to the tool, securing levers to the bushing tool and disposing force applying means in engagement with said levers to rotate the same to thereby turn said worn part of said bushing out of alignment with said driving sprocket.

4,050,142

METHOD AND APPARATUS FOR MANUFACTURING EXTRUDED STRUCTURAL PROFILES FROM ALUMINUM BASED METAL SCRAPS

Toshiro Takahashi; Toshihiro Nagano, both of Shizuoka; Shozo Iguchi, Shizuoka; Masaru Kikuchi, Fiji; Katsuhiko Nakamura, Shizuoka, and Atsushi Mochizuki, Shimizu, all of Japan, assignors to Riken Keikinzoku Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed June 11, 1975, Ser. No. 585,860

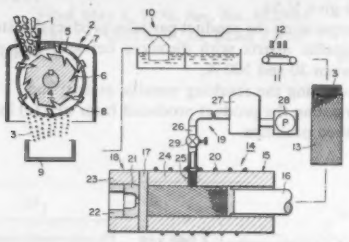
Claims priority, application Japan, June 14, 1974, 49-67944

Int. Cl.² B23Q 17/00

U.S. Cl. 29—403 5 Claims

1. A method of producing extruded structural profiles from aluminum based scrap materials comprising steps of; introducing aluminum based scrap materials into the extrusion chamber of an extruder housing having an extruder opening in communication with the chamber, exhausting air from the extruder housing chamber and from in and about the scrap materials in the extrusion chamber to substantially eliminate voids in the

final profiles, preventing air from being drawn into the extruder housing chamber while air is being exhausted therefrom, extruding the scrap material through the extruder opening under a temperature suitable for hot extrusion, providing



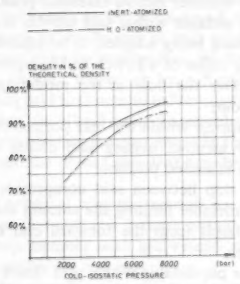
scrap materials in the form of finely divided metal chips, packing such materials in a mesh cage consisting of the same material as the scrap metal chips, and inserting the packaged scrap metal chips and cage into the extruder housing chamber.

4,050,143

METHOD OF PRODUCING DENSE METAL TUBES OR THE LIKE

Christer Aslund, Torshalla, Sweden, assignor to Granges NYBY AB, Sweden

Filed Apr. 18, 1975, Ser. No. 569,264
Claims priority, application Germany, Apr. 19, 1974, 2419014
Int. Cl.² B22F *3/24*
U.S. Cl. 29—420.5 **17 Claims**



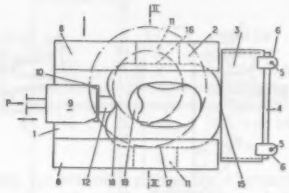
1. In a method for producing an elongated dense metal object in which metal powder is sealed in a metal container, the metal container with the metal powder therein is partially compressed in a first compression step and the partially compressed metal container so formed is extruded at elevated temperature in a second compression step, the improvement wherein (1) the metal particles of said metal powder are substantially spherical, (2) said container is formed from a ductile metal, (3) the wall thickness of said container is at most 5% of the outer diameter of said container, (4) said metal contaner is subjected to cold-isostatic pressure acting on all surfaces of said container during said first compression step, and (5) said metal container is compressed until the density of the metal powder therein reaches at least 80% of the theoretical density during said first compression step.

4,050,144

METHOD OF AND APPARATUS FOR REMOVING PUNCTURE-RESISTANT TUBES FROM TIRES

Guy de Massacré, Paris, France, assignor to Hutchinson Mapa, Paris Cedex, France

Filed Aug. 20, 1976, Ser. No. 716,342
Claims priority, application France, Sept. 19, 1975, 75.28719
Int. Cl.² B60C *25/00*
U.S. Cl. 29—427 **9 Claims**



1. A method of removing puncture-resistant tubes from tires including a tire body having an outer wall, the method comprising:

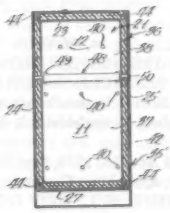
subjecting a tire containing a puncture-resistant tube to be removed to the simultaneous action of lateral squeezing exerted on two diametrically opposite squeezing zones of the outer wall of the tire and to a thrusting action exerted on a zone of the outer wall of the tire located 90° from said squeezing zones, in order to cause the tube to begin to separate from the tire body, and thereafter subjecting the tire to a thrusting action exerted, during lateral squeezing on said squeezing zones, on a zone of the tire diametrically opposite the zone on which the thrusting action was first exerted, to cause the tube progressively to detach itself completely from the tire body.

4,050,145

METHOD OF MAKING REFRIGERATION APPARATUS ENCLOSURE STRUCTURE

Arthur E. Benford, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Division of Ser. No. 601,636, Aug. 4, 1975, Pat. No. 3,989,329, which is a division of Ser. No. 433,071, Jan. 14, 1974, Pat. No. 3,913,996. This application July 19, 1976, Ser. No. 706,824
Int. Cl.² B23P *3/00, 19/04*
U.S. Cl. 29—460 **2 Claims**



1. A method of constructing a refrigeration apparatus enclosure comprising the steps of:

fabricating an outer cabinet;

providing a flat laminate of sheet liner and insulation;

slitting said insulation along lines corresponding to the corners of said outer cabinet;

folding said sheet liner at the slits with the sheet liner disposed interiorly;

fitting the folded laminate within said outer cabinet with the insulation confronting the inner surface of the cabinet; and

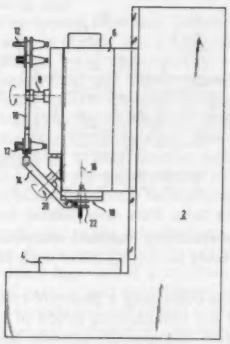
securing said laminate to said outer cabinet, including foaming plastic insulation in place within the cabinet in the voids formed between the sides of the insulation defining said slits resulting from said folding of the sheet liner.

4,050,146

SPINDLEHEAD WITH TOOL-CHANGING DEVICE

Michael Geiger, Munich, Germany, assignor to Friedrich Deckel Aktiengesellschaft, Munich, Germany

Filed May 10, 1976, Ser. No. 685,112
Claims priority, application Germany, June 6, 1975, 2525364
Int. Cl.[2] B23Q *3/157*
U.S. Cl. 29—568 **2 Claims**



1. In a spindlehead for a tool machine which is movable in at least one axial direction and has at least one spindle, comprising tool-changing means mounted on and movable with said spindlehead and includes a tool magazine and a changing arm which can be pivoted in front of said spindle and support means for supporting said changing arm for movement in a direction parallel to the spindle axis for effecting an insertion of a tool directly into said spindle and for removing said tool from said spindle and, simultaneously therewith, the removal of a tool from said tool magazine and a placement of said tool in said tool magazine, respectively, the improvement comprising wherein said tool magazine includes driving sleeve means receivable in said spindle, said changing arm being adapted to remove said driving sleeve means from said tool magazine and insert same into said spindle and wherein said spindlehead includes means for receiving a multiple-spindle unit which can be driven by said driving sleeve means mounted on said spindle, said multiple-spindle unit having a recess therein for receiving said changing arm when the multiple-spindle unit is mounted on said spindlehead.

4,050,147

METHOD FOR THE PRODUCTION OF DUCTILE AND STABLE PARTICLE-SUPERCONDUCTORS

Heinrich Winter, Kurt-Schrumacherstr. 4, Eschborn, and Darius N. Sethna, Hedwig Dransfeldstr. 3, Frankfurt, both of Germany

Filed Apr. 13, 1976, Ser. No. 676,589
Claims priority, application Germany, Apr. 16, 1975, 2516747
Int. Cl.[2] H01L *39/12*; B22F *1/00*; H01L *39/24*
U.S. Cl. 29—599 **15 Claims**

1. A method for the production of ductile and stable particle-super conductors comprising the steps of:

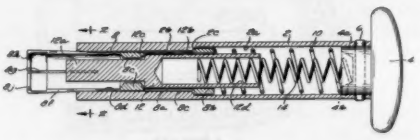
a. producing superconducting particles having an average particle diameter of 20 to 500 A by reacting, in a hydrogen plasma,
   i. a halogenide of niobium with nitrogen to give NbN;
   ii. a halogenide of niobium with nitrogen and methane to give $NbN_{1-x}C_x$ with x being less than or equal to 0.5;
   iii. a halogenide of niobium with a halogenide of aluminum to give Nb_3Al;
   iv. a halogenide of niobium with a halogenide of silicon to give Nb_3Si;
   v. a halogenide of niobium with halogenide of germanium to give Nb_3Ge;
   vi. a halogenide of niobium with a halogenide of tin to give Nb_3Sn;
   vii. a halogenide of vanadium and a halogenide of gallium to give V_3Ga; or
   viii. a halogenide of vanadium with a halogenide of silicon to give V_3Si;
b. incorporating the product particles produced in step (a) in a metallic matrix with distances between said particles between 20 and 500 A;
c. compacting the resulting metallic matrix; and
d. fabricating the product produced from step (c) into semi-finished products.

4,050,148

SNAP-IN BUSHING SWITCH REMOVAL TOOL

Jerome K. Hastings, Sussex, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed June 14, 1976, Ser. No. 695,915
Int. Cl.[2] B25B *27/14*
U.S. Cl. 29—764 **7 Claims**



1. A removal tool for releasing a snap-in bushing switch from its hole in a mounting panel comprising:

an elongated tubular compressor member having an open forward end and a closed rear end;

an elongated hollow chuck member in said tubular compressor member and having a divided and flared tubular section at its forward end forming a chuck normally projecting out from the open forward end of said tubular compressor member into its extended position and being rearwardly slidable within said tubular compressor member, said chuck being adapted to be placed about the snap-in bushing collar of a switch and to squeeze it small enough to re-enter the hole in the mounting panel for release therefrom;

a return spring within the rear portion of said tubular compressor member biasing said chuck member forwardly into its extended position;

a chuck stop between said compressor member and said chuck member limiting the amount that said chuck member extends from the forward end of said compressor member;

an ejector pin slidable within said chuck member and a stop therebetween that limits the forward movement of said ejector pin with respect thereto to retain it therewithin;

and an ejector operating spring between said compressor member and said ejector pin compressible upon forward sliding movement of said compressor member relative to said chuck member;

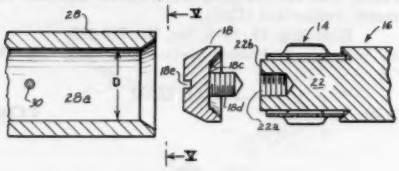
said chuck being adapted to be pressed against a mounting panel around the snap-in bushing collar of a panel-mounted switch to cause the switch actuator to depress said ejector pin whereafter depression of said compressor member causes the forward end thereof to slide over said chuck against the panel and to constrict said divided and flared section and causes said ejector operating spring to be compressed thereby to cause said chuck to squeeze the snap-in bushing collar of the switch small enough to allow said ejector pin to snap the switch out of the panel hole.

4,050,149

METHODS AND APPARATUS FOR ELECTRICAL CONTACT ASSEMBLY

Glenn E. Storck, Long Valley, and Andrew A. Kominiak, Flanders, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Filed May 6, 1976, Ser. No. 683,844
Int. Cl.[2] H01R 13/16; B25B 27/00
U.S. Cl. 29—630 R 10 Claims



1. A method for making a contact assembly of type having a cylindrical terminal member and a contact element coaxially disposed relative to said terminal member and retained thereby, said contact element comprising a strip member with first and second contact finger sets extending respectively angularly outwardly of opposite surfaces of said strip member, said method comprising the steps of:

a. forming said terminal member in first and second releasably engageable parts, forming a contact element retention surface on each such part and forming a contact element support surface on at least said first part;

b. shaping said contact element into cyindrical configuration;

c. applying such cylindrically shaped contact element to said terminal member first part with said first contact finger set in engagement with said support surface and, while applying common force to the fingers of said second contact finger set selected to be no greater than the force applied to said second contact finger set by a further terminal member engaging said first-mentioned terminal member in circuit connection use of said contact assembly, advancing said contact element strip member into engagement with said retention surface of said terminal member first part; and then

d. engaging said terminal member second part with said terminal member first part in a manner providing engagement of said strip member with said retention surface of said terminal member second part.

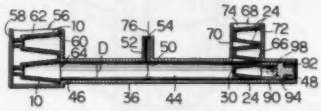
6. A kit of parts for assembling an electrical terminal member, said kit comprising in first part a contact element comprising a strip member having first and second contact finger sets extending respectively angularly outwardly of opposite surfaces of said strip member, and in second part an assemby tool for applying said contact element to a terminal member having first and second separable parts defining contact element retention surfaces and a cylindrical contact element support surface therebetween, said assembly tool comprising a cylindrical body adapted to apply circumferential force to said contact element uniformly thereof, said circumferential force being substantially the same as that applied by a further terminal member when in mating engagement with said first mentioned terminal member, and said tool body further adapted to place said contact element in engagement with said retention surface of said terminal member first part.

4,050,150

MEDICAL NEEDLE HOLDER ASSEMBLY AND METHOD OF AND APPARATUS FOR MANUFACTURING MEDICAL NEEDLE HOLDING ASSEMBLY

Soji Ishikawa, No.85, 1 chome, Kamata, Setagaya, Tokyo, Japan

Division of Ser. No. 602,740, Aug. 7, 1975, Pat. No. 4,001,929.
This application Oct. 6, 1976, Ser. No. 730,251
Int. Cl.[2] B23P 19/04
U.S. Cl. 29—777 11 Claims



1. Apparatus for assembling together a generally tubular needle holder, a filter element composed of a wad of a predetermined length of filament yarn and a generally tubular filter retainer adapted to be received in said needle holder with said filter element fitter to the needle holder, comprising (1) an elongated hollow transport tube having a longitudinal passageway which is open at its foremost end and having formed in its intermediate portion an opening which is sized to permit said filament yarn to pass therethrough, (2) first feeding and positioning means for feeding said needle holder in each cycle of operation into a predetermined position longitudinally aligned with said longitudinal passageway in said transport tube and having its rearmost end located at the open foremost end of said longitudinal passageway, (3) second feeding and positioning means for feeding said filter retainer in each cycle of operation into a predetermined postion within said longitudinal passageway in said transport tube, said predetermined position of the filter retainer being longitudinally spaced apart and aligned with said predetermined position of said needle holder across said intermediate portion of said longitudinal passageway, (4) third feeding and positioning means for feeding said filament yarn in each cycle of operation into a predetermined position in said intermediate portion of said longitudinal passageway of said transport tube through said opening formed in the intermediate portion, (5) pneumatic transfer means for producing in said longitudinal passageway in said transport tube a unidirectional stream of air flowing from said intermediate portion toward said predetermined position of said filter retainer for moving said filament yarn from said predetermined position thereof toward said filter retainer in said predetermined position thereof until the filter element is forced in the form of a tangle against the foremost end of the filter retainer, and (6) drive means for moving said filter retainer from said predetermined position thereof toward said needle holder in said predetermined position thereof with said tangle of said filament yarn carried on the foremost end of the filter retainer and forcing the filter retainer into said needle holder in said predetermined position thereof so that the tangle of the filament yarn is compacted into wad form within said needle holder.

4,050,151

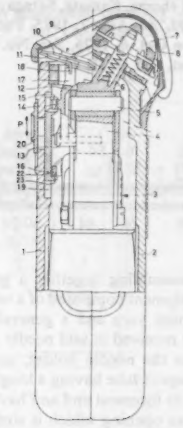
DRY-SHAVING APPARATUS

Jan de Boer, and Jan Reinink, both of Drachten, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 22, 1976, Ser. No. 669,324
Claims priority, application Netherlands, Apr. 11, 1975, 7504322
Int. Cl.[2] B26B 19/10
U.S. Cl. 30—34.1 3 Claims

1. A dry-shaving apparatus comprising a cutter for shaving off short hairs, an electric motor for driving said cutter, means for actuating said motor and movable between an "off" position and an "on" position, a trimmer for long hairs, a movable

element for coupling said trimmer to said motor, means for actuating said movable coupling element between a disengaged position and an engaged position with respect to the trimmer, and means associated with said motor-actuating



means and said movable coupling element, said associated means effecting movement of said coupling element into its disengaged position when said motor-actuating means is moved into its "off" position.

4,050,152

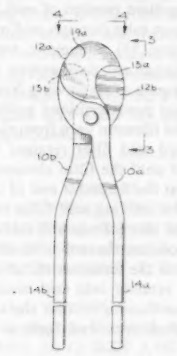
CABLE AND WIRE CUTTER

John R. Olson, 914 N. Lamer St., Burbank, Calif. 91506

Continuation-in-part of Ser. No. 627,663, Oct. 31, 1975, abandoned. This application Aug. 16, 1976, Ser. No. 714,480

Int. Cl.[2] B21F *13/00;* **B26B** *27/00*

U.S. Cl. 30—90.1 **5 Claims**



1. A hand tool for cutting wire, cable and the like comprising:

a pair of cooperating, elongated members pivotally secured at a locus which separates said members into a pair of handles and a pair of primary cutting blades, said members being mutually pivotal between an opened and a closed position;

each of said primary cutting blades comprises an inner sharpened edge, an outer blunt end having inbound and outbound edges, a back face extending from the sharpened edge to the inbound edge of the blunt end, and a front face extending from the sharpened edge to the outbound edge of the blunt end;

each of said inner sharpened edges has a substantially semi-circular configuration and, in combination, define oppositely disposed curves;

each of said back faces is substantially flat and said back faces are disposed in abutting relationship and traverse each other in such relationship; and

each of said front faces comprises a curved ramp rising from the semi-circular sharpened edge and extending to the outbound edge of the blunt end, with the gradient of each ramp being substantially the same and in the range between 33% and 50%.

4,050,153

CABLE AND WIRE-ROPE CUTTER

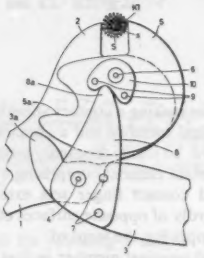
Félix Flisch, Rue des Melezes, Geneveys-sur-Coffrane Cant. Neuchatel, Switzerland (2206)

Filed Aug. 19, 1976, Ser. No. 715,893

Claims priority, application Switzerland, Aug. 25, 1975, 11000/75

Int. Cl.[2] B26B *13/00*

U.S. Cl. 30—250 **4 Claims**



1. A cable and wire-rope cutter comprising first and second handles pivoted on one another, a first cutting jaw formed rigidly on said first handle, a second cutting jaw pivoted on said first handle, and tooth means operatively connecting said second handle with said second jaw, wherein said tooth means comprise two tooth elements disposed on said second handle one of which is attached to the second handle and the other being formed integral therewith, one of said tooth elements engaging said second jaw for moving it from a position in which it is spaced to a maximum extent from said first jaw into a position in which said second jaw is enabled to cooperate with said first jaw for enclosing a cable or wire rope on all sides, and the other of said tooth elements thereafter engaging said second jaw for moving it past said first jaw, whereby said first and second jaws are enabled to cooperate with cutting said cable or wire rope, said tooth elements having differing multiplying ratios respectively corresponding to the differing power requirements for enclosing and for cutting said cable or wire rope.

4,050,154

PERFORATING TOOL

Hans Oetiker, 21 Oberdorfstrasse, Horgen, Switzerland

Filed May 24, 1976, Ser. No. 689,048

Int. Cl.[2] B26F *1/00*

U.S. Cl. 30—363 **25 Claims**

1. A tool for perforating a clamping band or the like comprising:

a first movable lever,

a second movable lever,

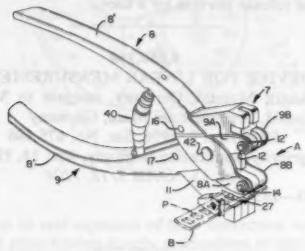
lever pivot means for pivotally connecting said first and second levers to one another for pivotal movement about a common lever pivot axis,

first and second perforating tool means supported at said levers and being movable with respect to one another,

said first tool means including a perforating plunger movable therewith,

said second tool means including guide means for guiding movement of said plunger along a predetermined plunger travel path,

and band support means carried by one of said tool means and including a support surface of supporting a band during perforating movement of an end portion of said plunger through said band during movement of said first and second levers with respect to one another,



said first tool means including a first rigid tool block which is pivotally connected to said first lever at a first tool block pivot axis,

said second tool means including a second rigid tool block which is pivotaly connected to said second lever at a second tool block pivot axis,

said first and second tool block pivot axes being at one side of said predetermined plunger travel path and said common lever pivot axis being at the other opposite side of said predetermined plunger travel path.

4,050,155

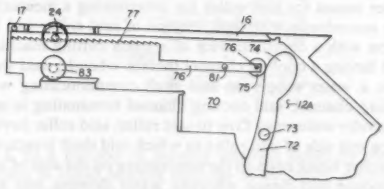
CAN OPENER GUN

Omero Pitocchi, Jersey City, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Feb. 9, 1976, Ser. No. 656,297

Int. Cl.[2] B67B *7/30*

U.S. Cl. 30—400 **2 Claims**



1. A portable can opener tool in the outline shape of a pistol comprising

a pistol-shaped basic frame,

a cutter wheel frame pivotably mounted to the main frame, and

a trigger handle pivotably mounted to the main frame, together with cutting blade means mounted on the cutter frame and can rim rotation means mounted on the basic frame linked to the trigger handle, in which the can rim rotation means comprises a slidable bar formed with serrated teeth on one edge and located so that some of the said serrated teeth bear, in use, against the undersurface of the rim of a can, the top of which is engaged by the cutter wheel, with said bar slidably linked to the basic frame so as to maintain substantically uniform spacing between the cutter wheel and the slidable bar when the bar travels in response to rotation of the trigger handle.

4,050,156

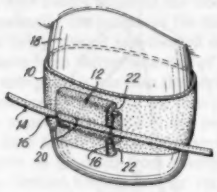
DENTAL APPLIANCE

Daniel Chasanoff, 33 Ardsley Drive, and Myles Z. Schneider, 18 Windgate Drive, both of New City, N.Y. 10956

Filed June 28, 1976, Ser. No. 700,198

Int. Cl.[2] A61C *13/00*

U.S. Cl. 32—2 **6 Claims**



1. A dental appliance, for use in the mouth as an improvement over polymeric fluorocarbon appliances, comprising a metallic base material and a coating including a para-oxybenzoyl homopolyester, a polymeric fluorocarbon and a pigment for providing a tooth colored appearance.

4,050,157

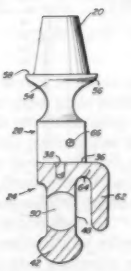
DENTAL IMPLANT

Maurice J. Fagan, Jr., and Maurice J. Fagan, III, both of 5360 Peachtree Dunwoody Road NE., Atlanta, Ga. 30342

Filed May 27, 1975, Ser. No. 581,419

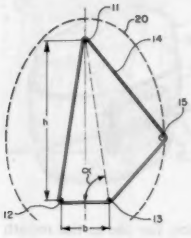
Int. Cl.[2] A61C *13/00*

U.S. Cl. 32—10 A **6 Claims**



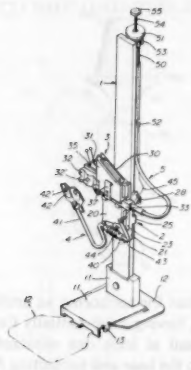
1. In a dental implant for anchoring an artificial tooth in the jawbone of a patient, having a substantially flat base embedded in the bone tissue and at least one substantially non-planar support connected to the base and projecting from the gingival line along a root axis of the tooth, the improvement including a shank extending between said support and the base along said root axis having a neck portion projecting from the ridge crest of the bone tissue toward said gingival line, said neck portion being dimensionally smaller than the base in a cross-sectional plane intersecting the lingual and buccal surfaces of the jawbone, said base including spaced edge portions extending in a mesial-distal direction from the shank transversely of the root axis and an intermediate portion, said intermediate portion being cross-sectionally thinner than the edge portions and having at least one opening formed therein, and a relatively rigid stabilizer connected to and spaced liqually from the base, said stabilizer being connected to one of the edge portions from which the shank projects and aligned with said opening in the base.

4,050,158
ARCH FORM COMPONENT
Allen C. Brader, 1350 Hamilton St., Allentown, Pa. 18102
Filed May 21, 1976, Ser. No. 688,786
Int. Cl.[2] A61C *7/00*
U.S. Cl. 32—14 A **13 Claims**



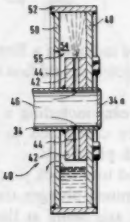
1. A method of making a compound elliptical arch form for use in an orthodontic system comprising the steps of, plotting three foci so that connections therebetween would generate an isoceles triangle, preparing a closed loop of string of a length greater than the sum of the sides of the triangle and such as to produce a given arch width, generating and recording an arch form by using the string and the foci, and bending a resilient wire according to the arch form.

4,050,159
HEM-LINE MARKER
Toshihide Kakinuma, No. 2-43, Kamiya Kita-ku, Tokyo, Japan
Filed Mar. 8, 1976, Ser. No. 664,788
Claims priority, application Japan, Mar. 13, 1975, 50-29531
Int. Cl.[2] A41H *9/02*
U.S. Cl. 33—9 R **7 Claims**



1. A hem-line marker used with needles having a head portion and a shank portion, comprising a base having an upright; clamping means mounted on and slidable along said upright for clamping a portion of the cloth of a garment, said clamping means comprising a clamping member mounted for pivotal movement into and out of a position in which it clamps said cloth portion, and means permanently biasing said member out of said position; pin inserting means for inserting pins at an inserting position into the clamped cloth portion; pin storing and feeding means for feeding pins to said inserting position; operating means for operating said clamping means and said pin inserting means, comprising a first elongated flexible element having one end connected to said pin inserting means and another end provided with a release portion, and a second elongated flexible element having spaced end portions connected to said clamping member and said other end of said first elongated flexible element; and means on said upright for normally detachably holding said other end portion of said first elongated flexible element in an inoperative position in which said second elongated flexible element is stack so that, when a user detaches said other end portion from said holding means and raises said release portion to an operating level higher than the level of said holding means, said second elongated flexible element becomes tensioned and moves said clamping member into said position in which it clamps said cloth portion in preparation for operation of said pin inserting means by actuation of said release portion by a user.

4,050,160
DEVICE FOR LINEAR MEASUREMENT
Ewald Schmitt, Maintal, Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Germany
Filed Apr. 9, 1976, Ser. No. 675,466
Claims priority, application Germany, Apr. 14, 1975, 1117394
Int. Cl.[2] G01B *3/12, 7/04*
U.S. Cl. 33—141 B **8 Claims**

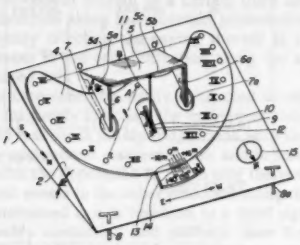


1. A device for the linear measurement of a hot workpiece to be separated by a torch-cutting machine comprising a water cooled measuring roller, a rotatable shaft, said roller being mounted on said shaft for rotation therewith, said shaft being rotatably mounted in tilting means, said tilting means moving said shaft and said roller to and form a position where said roller contacts the underside of the hot workpiece which in turn moves with respect to said roller whereby said roller is caused to rotate by the relative motion of the workpiece, transmitter means for said roller for determining a measuring length in accordance with said rotation of said roller and for connection with a control device of a torch cutting machine, said shaft having a cooling channel therein whereby said shaft is hollow, a water supply on said shaft communicating with said cooling channel, said cooling channel terminating in said roller whereby water may flow to said roller, said roller having a flange on one side of said roller to which said shaft is secured, and said roller being open to the atmosphere on the side of said roller opposite said flange whereby water flowing into said roller may be expelled to the atmosphere through said open side.

4,050,161
TRUE NORTH MERIDIAN INDICATOR
Tokutaro Yabashi, 265 Akasaka, Ogaki, Gifu, Japan
Filed Nov. 26, 1975, Ser. No. 635,308
Int. Cl.[2] G04B *49/04*; G01C *17/34*
U.S. Cl. 33—270 **1 Claim**

1. A meridian indicator comprising a base plate, an inclined plate disposed at a selected angle to said base plate, an hourly graduated arcuate plate, means rotatively supporting said arcuate plate upon said inclined plate, a rectangular style plate, means supporting a first edge of said style plate at a selected angle to the inclined plate, adjustable means for angularly positioning said style plate at a selected angle relative to a horizontal plane, a weighted string means attached to a second edge of said style plate which is perpendicular to said first

edge, apertures in the inclined plate and the arcuate plate positioned so that said weighted string means adjustably passes therethrough, and a latitude scale means disposed on said inclined plate and juxtapositioned to said weighted string means as it passes through said apertures, and equation of time correction scale means disposed upon said arcuate plate, and a longitude scale means disposed upon said inclined plate in



juxtaposition to said equation of time correction scale means, said arcuate plate having hourly graduations so that when said first edge of said style plate is pointing to true north, the shadow cast by either the sun of said first edge or a third edge parallel to said first edge of said style plate falls correctly upon an hourly graduation upon said arcuate plate to read true solar time.

4,050,162

METHOD AND APPARATUS FOR REMOVING LIQUID FROM LIQUID BEARING MATERIAL

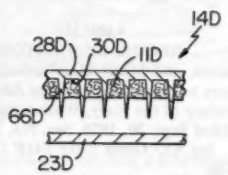
James T. Candor, 5440 Cynthia Lane, Dayton, Ohio 45429

Continuation-in-part of Ser. No. 541,218, Jan. 15, 1975, Pat. No. 3,977,937, which is a continuation-in-part of Ser. No. 405,023, Oct. 10, 1973. This application June 11, 1976, Ser. No. 695,092

The portion of the term of this patent subsequent to Aug. 31, 1993, has been disclaimed.

Int. Cl.² F26B *3/34*

U.S. Cl. 34—1 **28 Claims**



1. In a method of moving retained liquid by electrostatic action in liquid bearing material of the liquid absorbing type, the improvement comprising the step of disposing a plurality of needle-like projections to extend completely through said material to assist said electrostatic action in moving retained liquid in said material.

4,050,163

PROCESS AND APPARATUS FOR DRYING GRAIN IN SITU

Clifton Stanley Short, P.O. Box 105, Kenton, Del. 19955

Continuation-in-part of Ser. No. 643,993, Dec. 31, 1975, abandoned. This application Sept. 30, 1976, Ser. No. 728,144

Int. Cl.² F26B *3/06*

U.S. Cl. 34—22 **13 Claims**

1. Apparatus for drying grains in situ in a grain bin having an upper grain surface when filled, comprising in combination:

a. a generally rectangular bin of a substantial length and width comprising;

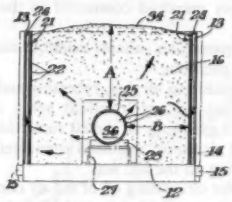
1. a normally horizontal air impervious floor;

2. vertical side panels running lengthwise of the bin to define the length of the bin, said side panels having a large number of perforations substantially throughout its surface, with said perforations being smaller in size than the grain to be dried to allow air to pass and prevent grain from passing therethrough; and

3. vertical end panels normally perpendicular to the side panels to define the ends of the bin;

b. perforated duct means adjacent the floor of said bin running longitudinally the length of the bin, said perforated duct means being spaced and located such that the horizontal distance from the perforations of the duct means to the nearest side panel is less than the vertical distance from the uppermost perforations of the duct means to the location of the upper grain surface, the perforations of said perforated duct means are of a size small enough to prevent the grain to be dried from entering said duct, said duct means further having hot air receiving means for receiving hot air under pressure from a source exterior of the bin into one end of the duct means and the other end of the duct means being in an airtight seal; and

c. high-pressure power driven air fan means and associated air heater means arranged exteriorly of the bin and operatively associated with said hot air receiving means of the perforated duct means to force hot air under pressure into the perforated duct means, to provide lateral flow of hot dry air from the perforated duct means towards the perforated side panels whereby the hot air removes the moisture from the grain to be dried and the air and moisture pass both through the perforations of the side panels and through the top grain surface.



11. A process for drying moisture containing grain in situ in a grain bin having an upper grain surface, said bin having an air impervious floor, side panels defining the length of the bin with said side panels having perforations to allow air to pass there through without the passage of the grain to be dried, perforated duct means to convey heated air into said grain bin, said bin further having end panel to define the width of the bin, said process comprising in combination:

a. heating and pressurizing air exteriorly of the bin;

b. directing said heated air under pressure into the bin and along the longitudinal length of the bin near the floor at points nearer to the perforated side panels than the grain surface;

c. directing the heated air under pressure both laterally and outwardly from the interior of the bin towards the perforated side panels and also upwardly towards the grain surface throughout the grain and contacting the heated air with the moisture containing grain to pick up moisture from the grain; and then

d. further directing said heated air containing moisture both to and through the perforated side panels and also upwardly and out through said grain surface by:

1. directing said heated air under pressure into said perforated duct means extending along the longitudinal length of said grain bin with said duct being located near the floor of the bin at a distance such that the vertical height from the perforations of the duct means to the grain surface is greater than the distance from the perforated side panels to provide sufficient confinement of the heated air to force said heated air outwardly laterally to and through the side panels while at the

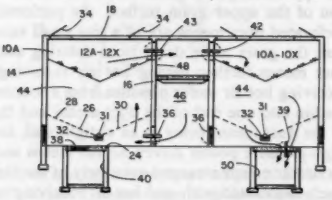
same time a sufficient portion of the heated air moves upwardly throughout the grain and exits from the grain surface.

4,050,164

GRAIN DRYER CONSTRUCTION

Bowen Campbell, Des Moines, Iowa, assignor to Cromwell B. Campbell

Filed Mar. 8, 1976, Ser. No. 664,869
Int. Cl.² F26B *11/22*
U.S. Cl. 34—182 **6 Claims**



1. Improved apparatus for batch drying at least two batches of grain comprising, in combination:

first and second separate batch bins, each bin forming an enclosure for grain and having a top, a bottom and sides;

first and second separate air flow doors to each batch bin, at least one air flow door at the top of each bin and at least one air flow door at the bottom of each batch bin;

an air supply manifold connected to the bottom doors of each bin;

a second separate, air exhaust manifold connected to the top doors of each bin;

means for receiving, drying, reheating and discharging all of the air, the exhaust manifold being connected to said means for receiving all the air from the air exhaust manifold, said air supply manifold connected to said means for discharging all the air; and

fan means for circulating all of the air continuously through said supply manifold, into said bins, through said exhaust manifold and said means for drying and reheating, whereby the air is entirely and continuously recycled through the batches of grain to remove moisture therefrom, the air temperature and moisture content being entirely controlled within the apparatus for drying independent of ambient conditions external the apparatus for batch drying.

4,050,165

TEACHER-STUDENTS INTERCOMMUNICATION SYSTEM

Satoshi Yamauchi, Yokohama, and Shigeru Yamazaki, Tanashi, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Feb. 20, 1976, Ser. No. 659,649
Claims priority, application Japan, Feb. 25, 1975, 50-23205
Int. Cl.² G09B *5/00*
U.S. Cl. 35—8 A **11 Claims**

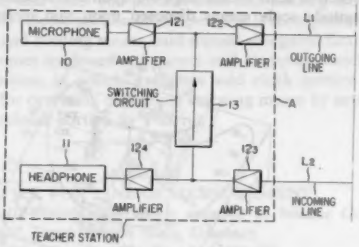
1. In an intercommunication system in which a teacher station and a plurality of student stations are interconnected with a common outgoing line and a common incoming line, the improvement wherein said teacher and student stations comprise:

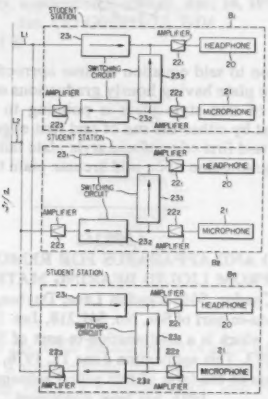
a transmitter and a receiver, the transmitter and receiver in said teacher station being respectively connected to said outgoing line and said incoming line;

first switching circuit means in said teacher station for selectively connecting said incoming line to said outgoing line;

second switching circuit means in each student station for selectively connecting the corresponding receiver and transmitter respectively to said outgoing and incoming lines;

means in each student station for selectively controlling the corresponding second switching circuit means; and





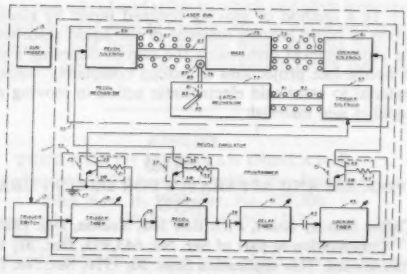
means in said teacher station for selectively controlling all of said second switching circuit means.

4,050,166

RECOIL SIMULATOR

Edmund Swiatosz, and Albert H. Marshall, both of Maitland, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 30, 1976, Ser. No. 723,488
Int. Cl.² G09B *9/00*; F41F *27/00*
U.S. Cl. 35—25 **19 Claims**



1. A recoil simulator, comprising in combination:

a movable mass having a predetermined axis along which movement thereof may occur;

first resilient means effectively connected to said movable mass for timely effecting the urging thereof in a certain first manner in one direction along the aforesaid predetermined axis in effective response to a first signal;

first actuator means effectively connected to said movable mass for timely effecting the movement thereof in a certain second manner in timely conjunction with the urging thereof by said first resilient means in said one direction along the aforesaid predetermined axis in response to a second signal;

second resilient means playably spatially disposed from said movable mass for timely inhibiting and subsequently stopping the movement thereof in a certain third manner in said one direction along the aforesaid predetermined axis and for timely effecting the urging thereof in a certain fourth manner in the other direction along the aforesaid predetermined axis;

second actuator means effectively connected to said movable mass for timely effecting the movement thereof in a certain fifth manner in timely conjunction with the urging thereof by said second resilient means and in timely conjunction with the opposition to the urging thereof by said first resilient means in the other direction along the aforesaid predetermined axis in response to a third signal;

means releasably contacting said movable mass for timely effecting the holding thereof in a predetermined cocked position when said mass has been moved a predetermined distance in the aforesaid other direction along said predetermined axis by said second resilient and actuator means; and

third actuator means connected to said mass cocked position holding means for timely effecting the release of the aforesaid movable mass.

4,050,167

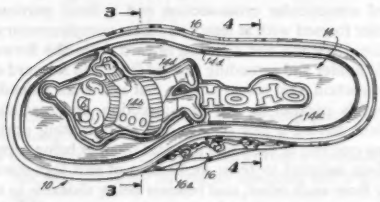
ARTICLE OF FOOTWEAR WITH A THREE-DIMENSION INSET FIGURE IN ITS RECESSED SOLE AND METHOD OF MAKING THE SAME

Jonas Senter, 910 Fifth Ave., New York, N.Y. 10011

Filed Mar. 1, 1976, Ser. No. 662,929

Int. Cl.² A43B *13/04, 23/28, 3/28*

U.S. Cl. 36—32 R **1 Claim**



1. An article of footwear including a sole having a walking surface, an upper, and having at least one recessed area in said sole, comprising three-dimensional inset figure secured in said recessed area, which figure is at least partly embossed with an overlay illustration on the exposed surface of said inset figure, said exposed surface being substantially flush with said walking surface, said inset figure being adapted to leave an imprint of said illustration when the wearer walks on soft ground, wherein said inset figure is slightly smaller in its outlines than those of said recessed area of the sole, thereby presenting a peripheral ridge about said recessed area that limits a set-off border in said sole and around said inset figure, which border makes for a secure, non-slip grip during walking even when said sole is wet.

4,050,168

FOOTWEAR WITH DETACHABLE SYMBOLS

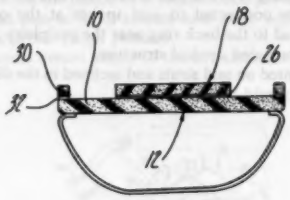
Carl E. Pace, 2059 N. Maple Trail, Wixom, Mich. 48096

Filed June 14, 1976, Ser. No. 695,796

Int. Cl.² A43B *23/00, 3/28, 13/12*

U.S. Cl. 36—136 **5 Claims**

1. A footwear having a sole adapted to engage a ground supporting surface, a raised border of resilient material detachably attached to and extending around the entire periphery of said sole, means for detachably attaching said border to said sole means detachably attached to said sole within said border



comprising at least one raised symbol and means for detachably attaching said symbol to the sole of said footwear whereby said symbol is imprinted on said ground supporting surface as said sole engages said ground supporting surface.

4,050,169

SNOW DISTRIBUTION SYSTEM

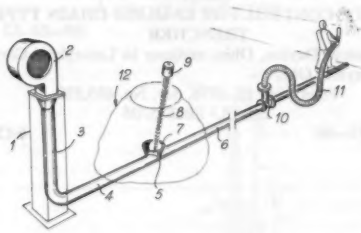
Armand René Pasquier, Annecy, France, assignor to Etudes Techniques et Realisations (E.T.R.), Douai, France

Filed Oct. 29, 1975, Ser. No. 626,638

Claims priority, application France, Oct. 30, 1974, 74.36222; Oct. 10, 1975, 75.31099

Int. Cl.² F25C *3/04*

U.S. Cl. 37—1 **10 Claims**



1. Apparatus for distributing snow from a storage area to a ski track comprising a motor assembly, a air lock manifold operated by said motor assembly and having a pair of inlets and an outlet, snow intake means operated by said motor assembly connected to one of said inlets for delivering snow to said manifold, an air blower operated by said motor assembly and connected to the other of said manifold inlets for ejecting said snow from said manifold outlet, an elongated main duct arranged at least in part to extend along the ground in association with said ski track, means connecting said main duct to said manifold outlet, a plurality of outlet mouths formed in said main duct, at least one secondary duct connected to selected ones of said outlet mouths of said main duct and extending away therefrom, a flexible distribution hose connected to said secondary duct, and a nozzle connected to said distribution hose, said nozzle being mounted on a movable support and having at least two degrees of freedom of movement.

4,050,170

DREDGE CUTTER HEAD

Norman P. Proehl, Lake Forest, Ill., assignor to Norman P. Proehl, Lake Forest, Ill.

Filed Feb. 17, 1976, Ser. No. 658,245

Int. Cl.² E02F *3/92*

U.S. Cl. 37—67 **8 Claims**

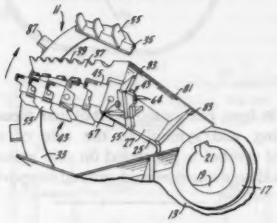
1. A cutter head for a suction dredge, including: a hub,

a plurality of generally radially extending spokes of substantially equal lengths mounted on said hub,

a back ring of greater radius than said spokes,

struts extending between said spokes and said back ring with said struts connected to said spokes at the outer ends thereof and to the back ring near the periphery thereof to form a truncated conical structure,

blades mounted on said struts and inclined in the direction of rotation of said cutter head, and



radially extending forwardly projecting scoop plates mounted on said spokes at the leading edges thereof with said scoop plates being inclined in the direction of rotation of said cutter head,

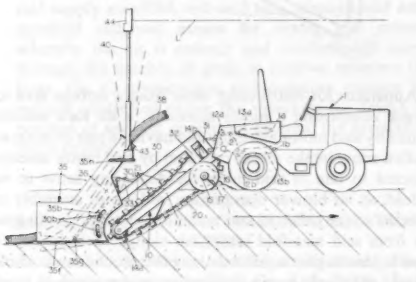
the radially outer ends of said scoop plates abutting and connecting with the forward ends of said strut blades to form generally L-shaped digging members.

4,050,171

DEPTH CONTROL FOR ENDLESS CHAIN TYPE TRENCHER

Ted L. Teach, Dayton, Ohio, assignor to Laserplane Corporation, Dayton, Ohio

Filed May 12, 1976, Ser. No. 685,528
Int. Cl.² E02F 5/06
U.S. Cl. 37—86 **6 Claims**



1. In a trencher of the type having an endless chain carrying a plurality of digging scoops peripherally around an elongated digging frame, said digging frame having the forward end thereof pivotally mounted on a vehicle for movements in a vertical plane parallel to the path of travel of the vehicle, and means on the vehicle for driving said chain, the improvement comprising:

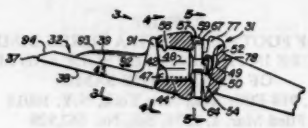
1. a sub-frame overlying said digging frame and having its front end rigidly secured to said digging frame;
2. a trench bottom shoe having an elongated bottom surface adapted to ride on the bottom of the newly dug trench, and means for pivotally mounting said shoe to the trailing end of said sub-frame for pivotal movements about a single horizontal axis provided on said digging frame, whereby said bottom surface is immediately tilted by variations in vertical position of said axis;
3. a cylinder for positioning said digging frame relative to said vehicle, thereby controlling the effective depth of the trench being dug;
4. means for establishing a reference plane at a known elevation;
5. an upstanding mast having its bottom end rigidly secured to said shoe at a point horizontally ahead of said bottom surface of said shoe, said mast being perpendicular to said bottom surface, whereby any upward or downward pivotal movement of said shoe relative to the digging frame produces a reverse tilting movement of the top of said mast relative to said reference plane, and
6. means on the top of said mast for determining the height of said mast relative to said reference plane, and
7. means for supplying fluid to said cylinder to maintain the top of said mast in a fixed vertical position with respect to said reference plane.

4,050,172

EXCAVATOR TOOTH, HOLDER THEREFOR AND STAPLE RETAINER

Gerald A. Petersen, San Francisco, Calif.

Continuation of Ser. No. 431,509, Jan. 7, 1974, abandoned, which is a continuation-in-part of Ser. No. 330,050, Feb. 6, 1973, Pat. No. 3,826,024, which is a continuation-in-part of Ser. No. 215,739, Jan. 6, 1972, Pat. No. 3,751,834. This application Apr. 7, 1975, Ser. No. 565,776
Int. Cl.² E02F 9/28
U.S. Cl. 37—142 A **8 Claims**



1. In combination an excavating tooth having a proximal portion of non-circular cross-section and a distal portion, a tooth holder formed with at least one recess complementary to said proximal portion and opening inward from the forward end of said holder and extending inward from said forward end in a first direction, said recess having first side walls extending approximately parallel to said first direction, and a retainer, said retainer having a pair of legs and a connecting portion connecting one end of each said leg, said retainer being formed of a resilient material to resist movement of said legs toward and away from each other, said retainer being slideable in said holder between operative and retracted positions, said holder formed with an opening extending from a first side of said holder to the second side of said holder opposite said first side, said opening having opposed second side walls extending approximately parallel to said first direction, said opening being spaced back from said forward end, said opening extending parallel to a plane generally perpendicular to said first direction, at least one said second side wall having a first portion, a second portion laterally offset with respect to said first portion and a first shoulder interconnecting said first and second portions, said proximal portion of said tooth formed with a notch and having a second shoulder rearward of said notch, at least on leg of said retainer extending along one said second wall adjacent said first and said second sides and into said notch when said retainer is in operative position and abutting said second shoulder to restrain said tooth against dislodgment from said holder, said one leg being movable out of said notch without total removal of said one leg from said holder when said retainer is in retracted position, said legs biased to diverge from each other so that said legs engage said second walls to resist unintentional movement of said retainer, said one retainer leg being entirely inside said holder when said retainer is inoperative position, said retainer being assembled with said holder when either in retracted or in operative position, at least one leg of said retainer having an upper portion, a lower portion

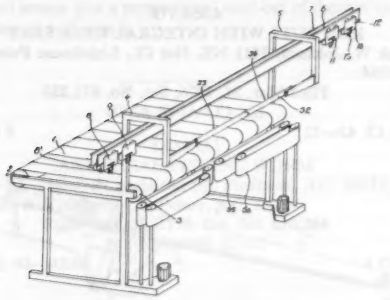
offset laterally relative to said upper portion and a third shoulder at the level of the interconnection of said upper and lower portions, said third shoulder being at all times within said opening when said retainer is either in operative or in retracted positions, said first shoulder engaging said third shoulder to limit outward movement of said retainer when said retainer is in retracted position, said distal portion of said tooth comprising a blade having substantially parallel top and bottom surfaces, and a transverse cutting edge at its distal end, said distal end located approximately at the level of said proximal portion, said top and bottom surfaces slanting downwardly-rearwardly, said top surface having a fourth shoulder extending across the width of said distal portion transverse to said proximal portion and extending to an elevation substantially higher than the elevation of said proximal portion to form a protection for the forward end of a holder in which said tooth is held.

4,050,173

LAUNDRY FEEDING APPARATUS

Niels Johan Olsen, Akirkeby, Denmark, assignor to Firma Bora, S.A., Luxembourg

Filed Sept. 4, 1975, Ser. No. 610,373
Claims priority, application Denmark, Sept. 4, 1974, 4673/74
Int. Cl.² D06F *67/04*
U.S. Cl. 38—143 **10 Claims**



1. Apparatus for spreading and feeding pieces of laundry, comprising:

a conveyor for receiving laundry from a spreading apparatus; said conveyor having an upstream and a downstream end;

a spreading apparatus comprising at least one pair of clamping devices; each said clamping device including means for holding a piece of laundry; said clamping devices being positioned upstream of said upstream end of said conveyor and above said conveyor; clamping device moving means for moving said clamping devices of said pair thereof apart and together crosswise to the motion of said conveyor and always upstream of said conveyor;

a blade positioned further upstream from said conveyor than said clamping devices and positioned above said conveyor; said blade being movable toward said conveyor to contact the piece of laundry held by said clamping devices and to move the piece of laundry onto said conveyor.

4,050,174

REVOLVER GUN

Robert J. Hubbs, Riverside, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed July 19, 1976, Ser. No. 706,208
Int. Cl.² F41C *1/00*
U.S. Cl. 42—59 **2 Claims**

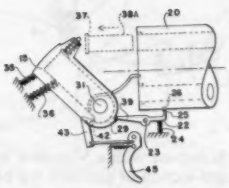
1. A revolver gun which ejects each spent cartridge immediately upon being fired, comprising a gun fitted with a revolver cylinder fitted with chambers for holding cartridges,

first spring-biased means to latch the revolver cylinder in a fixed position,

second means to rotate the revolver cylinder,

said first means linked to a breechblock pivotably mounted in said gun so as to release said latch when the breechblock is in a recoil position.

said second means linked to the breechblock so as to rotate



the revolver cylinder when the breechblock returns from the recoil position to a firing position,

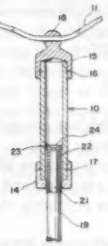
said breechblock pivotably mounted and spring-biased to remain in the firing position except under the recoil forces of a fired cartridge in the revolver cylinder, which fired cartridge serves to rotate the breechblock to the recoil position while the fired cartridge is ejected out of the revolver cylinder.

4,050,175

LOADING DEVICES FOR MUZZLE LOADING RIFLES

Lavern F. Mulinix, 445 W. High St., Alliance, Ohio 44460

Filed Sept. 10, 1976, Ser. No. 722,025
Int. Cl.² F41C *27/00*
U.S. Cl. 42—90 **9 Claims**



1. A loading device for a muzzle-loading rifle, comprising:

a tubular holder, adapted to contain gun powder and a ball shot,

an end cap for closing an end of said holder to contain the gun powder and ball therein, said end cap having a connection with said holder that may be broken by a pulling force applied in an axial direction on one of said end cap and holder while holding the other stationary to separate said end cap from said holder,

whereby to provide for transferal of said gun powder and ball from said holder through the opening of the barrel bore of said rifle and into said bore.

4,050,176

FLY TIE TOOL

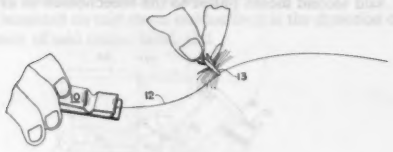
William Asper, Englewood, Colo., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed June 14, 1976, Ser. No. 696,120
Int. Cl.² A01K *91/04*
U.S. Cl. 43—1 **2 Claims**

1. A clip which may be fastened to a line

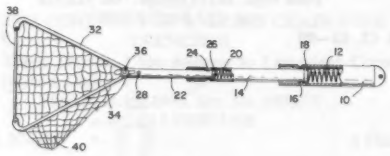
said clip formed of a spring material of two flat legs joined together by a U-section, with an end of a first leg bent as

a flange, said flange extending generally perpendicularly to the plane of the first leg towards the second leg, with the edge of said flange normally maintained in contact with said second leg, with the two legs of said clip shaped to apply spring bias serving to normally hold said flange edge in contact with the second leg, in which



the first leg is formed with a V-section located at substantially the mid-section of said first leg between the flange and the U-section, said V-section oriented so that the tip of the V-section normally bears against the said second leg, such that manually compressing the section of the first leg lying between the U-section and the V-section towards the second leg serves to lift the flange edge completely from contact with said second leg.

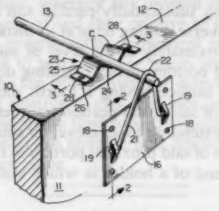
4,050,177
FOLDABLE FISH NET
Allen Gerritsen, 74 Heights Terrace, Middletown, N.J. 07748
Filed Feb. 20, 1976, Ser. No. 659,657
Int. Cl.[2] A01K *77/00*
U.S. Cl. 43—12 **2 Claims**



1. A foldable fish net comprising:
a. a hollow tubular handle;
b. a first tubular extension slidably secured within said handle between extended and retracted positions;
c. a pair of arms pivotably mounted at the end of said extension;
d. means for adjustably securing said arms in an open position;
e. a net mounted between said arms;
f. a storage compartment in said handle having an opening along a side of said handle to receive said net and arms;
g. wherein said open arms provide a triangular shaped support for said net; and
h. wherein a hollow portion of said handle receives said tubular extensions, said hollow portion being separated from said storage compartment.

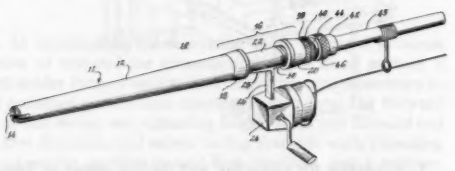
4,050,178
FISHING ROD HOLDER
Hugh T. Bryan, 1312 Third Ave., Albany, Ga. 31707
Filed Apr. 28, 1976, Ser. No. 681,015
Int. Cl.[2] A01K *97/10*
U.S. Cl. 43—212 **1 Claim**

1. A fishing rod holder for supporting a fishing rod in a cantilevered position from the gunwale of a boat with a minimum amount of protrusions extending from the gunwale, comprising a mounting plate, means for connecting said mounting plate in a generally vertical position on the gunwale, a generally U-shaped bail having outwardly extending opposite ends pivotally mounted to said mounting plate along a horizontal axis, said bail being normally urged by gravity into a vertical non-use position flush with said mounting plate and being selectively movable in a vertical arc to a use position to overlie the handle end of a fishing rod, cradle means mounted generally perpendicular to said mounting plate in a substantially horizontal plane along the upper surface of the gunwale with the uppermost portions of said cradle extending upwardly from the upper surface of the gunwale a distance of generally



one-half inch or less, said cradle means having a central generally U-shaped portion for receiving a portion adjacent said handle of said fishing rod in spaced relationship to said bail, whereby a fishing rod can be selectively supported by said bail and said cradle and said bail being movable by gravity to said non-use position when the rod is removed from engagement therewith.

4,050,179
ROD BUTT WITH INTEGRAL REEL SEAT
Frank W. Johnson, 2411 NE. 31st Ct., Lighthouse Point, Fla. 33064
Filed Mar. 31, 1976, Ser. No. 672,233
Int. Cl.[2] A01K *87/06*
U.S. Cl. 43—22 **8 Claims**



1. A fishing rod assembly including a rod butt and a reel seat and adapted to be fitted interchangeably to a rod tip, comprising a locating means adapted to locate a rod tip ferrule, said rod tip ferrule including means adapted to interact with said locating means for locating said rod tip ferrule with respect to said reel seat, mounting means for mounting said ferrule to said reel seat, and resilient water-tight sealing means interpositioned between said ferrule and said mounting means for sealing the mating surfaces between said ferrule and said reel seat, said rod butt, reel seat and ferrule all constructed of the same alloy.

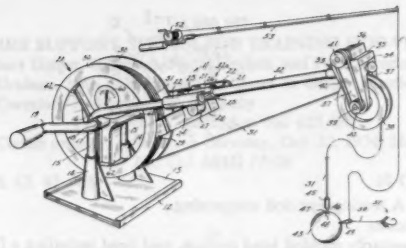
4,050,180
DOWNRIGGER REEL AND TEMPERATURE INDICATOR
Jack C. King, 678 Massachusetts Ave., North Muskegon, Mich. 49445
Filed Aug. 10, 1976, Ser. No. 713,116
Int. Cl.[2] A01K *89/00*
U.S. Cl. 43—27.4 **9 Claims**

1. A downrigger structure for spoke wheeled downriggers comprising:
a downrigger reel having spokes and flanges;
a segment shaped two-piece case with flanges thereon; said case flanges engageable with the spokes and flange of said downrigger reel and said case nesting between adjacent spokes;
an electronic circuit in said case;

a battery inside said case and operably connected to said circuit;

a selectively operable switch in said case selectively permitting flow of power to said circuit;

a cable encased in an outer resin sheath and including plural unsheathed load bearing strands and one highly conductive copper strand which is resin coated, said cable operably connected at one end to said circuit;



a thermal sensing element operably connected at the other end of said cable; and

a calibrated gage connected to said circuit whereby conductometric variances proportional to thermal variances in said sensor give a proportional read-out of thermal conditions at said sensor.

4,050,181

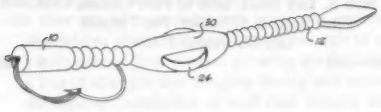
ARTIFICIAL FISHING WORM

Walter M. Young, 27 Anderson St., Piedmont, S.C. 29673, and Robert S. Young, Rte. 1, Pelzer, S.C. 29669

Filed Mar. 25, 1976, Ser. No. 670,264

Int. Cl.[2] A01K *85/01*

U.S. Cl. 43—42.06 **1 Claim**



1. An artificial fishing lure comprising,

an elongated body member having a substantially circular cross section adjacent a front portion, said cross section adjacent said front portion being larger than the cross section adjacent the tail portion with there being a substantial taper from adjacent said front portion to said tail portion,

an enlarged portion adjacent the central portion of said elongated member,

an elongated slot extending through said enlarged portion with the surfaces adjacent the ends of said slot being smooth and rounded

a tablet which generates a gas when contacted by water carried in said elongated slot, and said slot being substantially rectangular with the width being less than the diameter of said tablet so that said tablet extends out beyond the sides of said lure for being exposed to water when said lure is drawn through said water,

said lure being molded of a flexible material so that the surfaces on opposite sides of said slot are stretched securely holding said tablet therebetween even as said tablet dissolves.

4,050,182

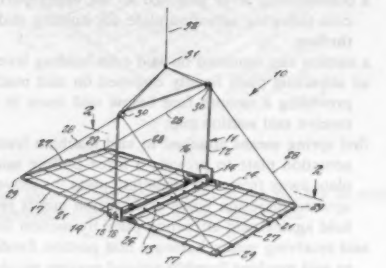
BOOK NET FOR CRABS, LOBSTERS, AND THE LIKE

Jerry Basile, 1840 67th St., 2nd Floor, Brooklyn, N.Y. 11204

Filed Jan. 24, 1977, Ser. No. 762,039

Int. Cl.[2] A01K *69/10*

U.S. Cl. 43—105 **1 Claim**



1. A book-net for catching crabs, lobsters and the like, comprising in combination, a central frame and a pair of pivotable frames, one of which is positioned adjacent each side of said central frame and both said pivotable frames being pivotable about one end of said central frame so to be provided between said position adjacent said central frame and a spread apart position 90 degrees away therefrom so that said pivotable frames are both on a common plane at right angles to said central frame, all said frames being made of a stiff material, said pivotable frames each having a loosely fitted rope net; spring means normally maintaining said pivotable frames in said spread apart position; a pair of nylon lines each having their opposite ends attached to opposite corners of a free end of each said pivotable frame and an intermediate portion of said nylon line extending through a loop at each corner of a free end of said central frame, while a center of each said nylon lines are attached to one end of a tethering line which at its other end can be held by a fisherman; said central frame being comprised of a U-shaped wire having said loops at its corners, and a U-shaped flat strip wherein bent over opposite flat ends are affixed to the opposite ends of said wire, said flat ends having bearings openings receiving opposite ends of said pivotable frames, and said flat ends also supporting a wire rod between said frames having bent up loops to which bait is attachable.

4,050,183

COIN TOY

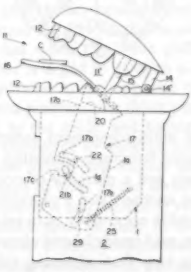
Ietatsu Watanabe, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Dec. 29, 1975, Ser. No. 644,441

Claims priority, application Japan, Jan. 25, 1975, 50-10835

Int. Cl.[2] A63H *33/00*

U.S. Cl. 46—4 **5 Claims**



1. A coin toy, comprising:

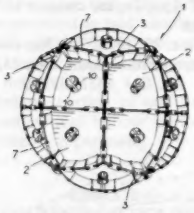
means for throwing said coin in a predetermined direction;
means for receiving said thrown coin;
said throwing means including:
a machine frame attached to said receiving means;
a coin-throwing actuation plate rotatably mounted in a vertical position in said machine frame;
a coin-holding lever attached to the upper portion of said coin-throwing actuation plate, for holding said coin to be thrown;
a suction cup mounted on said coin-holding lever;
an attracting plate fixedly disposed on said machine frame providing a smooth face below said lever in position to receive said suction cup;
first spring means attached to said machine frame and said actuation plate to provide a force pulling said actuation plate away from said attracting plate for movement in an upward direction when said suction cup is received and held against said attracting plate by suction forces;
said receiving means having a first portion fixedly attached to said machine frame, a second portion pivotally hinged to said first portion for rotation thereabout and means responsive to upward movement of said actuation plate for pivoting said second portion into an open position and subsequently pivoting said second portion into a closed position with respect to said first portion;
wherein said coin is placed on said coin-holding lever, said coin-holding lever is manually depressed, said suction cup held against said attracting plate by said suction forces and said receiving means is in a closed position, unitl said first spring means overcomes said suction forces of said suction cup against said attracting plate, causing said coin-throwing actuation plate and said coin-holding lever to rapidly rotate in an upward direction, throwing said coin in said predetermined direction and said second portion of said receiving means pivoting open, receiving said coin and closing.

4,050,184

MULTI-COMPONENT, SPHERICAL, ASSEMBLABLE TOY

Gervasio Chiari, via Antonelli 7, Cologne (BS), Italy

Filed Apr. 12, 1976, Ser. No. 676,286
Claims priority, application Italy, Jan. 28, 1976, 5118/76
Int. Cl.[2] A63H *33/06*
U.S. Cl. 46—17 **8 Claims**



1. An assemblable, multi-component, spherical toy comprising a supporting inner structure consisting of a plurality of quadrilateral elements and a plurality of couplers connecting said elements to one another, and a plurality of quadrilateral cover plates connectable removably onto said elements of said supporting structure, said quadrilateral elements comprising a convex plate having two first adjoining sides equal to each other and two second adjoining sides equal to each other, an edge upwardly extending all around said plate, and a plurality of V-shaped notches in said edge.

4,050,185

FACIAL LIQUID EXCRETING DOLL

Rouben T. Terzian, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 26, 1976, Ser. No. 652,414
Int. Cl.[2] A63H *3/48*
U.S. Cl. 46—135 A **21 Claims**

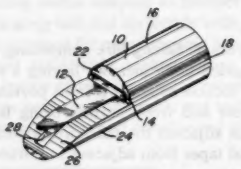
1. A tearing eye doll comprising:
a torso;
a unitarily molded head portion, said head including a flexible shell with a face on the front side thereof;
a unitarily molded interior wall spanning a portion of said shell and forming a liquid reservoir generally behind the face of the doll head;
deforming means secured to said torso for movably mounting the head thereon, said deforming means having a portion thereof extending into engagement with the interior wall for deforming said interior wall in response to movement of the head relative to the torso to reduce the volume of the reservoir;
inlet means formed in said head, in communication with said liquid reservoir, for introducing fluid into the reservoir; and
a plurality of apertures through said flexible shell generally in the facial area of the doll for the passage therethrough of liquid from the reservoir to simulate tearing.

4,050,186

SOUND PRODUCER

Otto C. Shults, 2107 Manchester Circle, and Major L. Boddicker, 3836 S. Taft Road, both of Fort Collins, Colo. 80521

Filed Aug. 2, 1976, Ser. No. 710,608
Int. Cl.[2] A63H *5/00*
U.S. Cl. 46—180 **9 Claims**



1. A wildlife call comprising:
an elongated body of a size and shape to be grasped and held by the human hand;
one portion of said body constituting a barrel open at one end for the outlet of sound and including a bore extending from said one end to a transverse wall terminating said bore with said bore having a predetermined cross-sectional area;
another portion of said body projecting from said wall away from said barrel and constituting a mouthpiece having a working surface exposed for insertion between the lips of the user and of widthwise flat configuration but curving outwardly in a direction away from said wall;
a groove running lengthwise centrally of said mouthpiece and opening into said bore, said predetermined cross-sec-

tional area of said bore being of the order of eleven times the maximum cross-sectional area of said groove;

and an elongated and planar reed, of laterally vibrant material, secured at one end in said wall in a position to overlie and substantially cover said groove when pressed thereupon by the lips of the user encircling said reed and said mouthpiece

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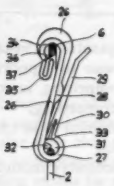
4,050,187

WIRE SUPPORT SYSTEM FOR TRAINING HOP VINES

Albert Geiger, Garmisch-Partenkirchen, and Peter Bruckmann, Grainau, both of Germany, assignors to Geiger Plastic KG, Garmisch-Parteakirchen, Germany

Filed Oct. 17, 1975, Ser. No. 623,453
Claims priority, application Germany, Oct. 22, 1974, 2450062
Int. Cl.² A01G *17/06*
U.S. Cl. 47—45 **10 Claims**



1. A trellis system for training hop vines comprising:

generally horizontal main wires and, connected therewith, generally vertical riser strands; each riser strand being a monofilament of plastic material having a pre-formed loop at its upper end,

a hook for each riser strand; said hook comprising narrow partially open eyes formed at opposite ends of said hook, and the said loop of the riser strands being adapted to be hooked into the lowermost eye of said hook, said hook being adapted to receive the generally horizontal main wires in its upper eye to connect said riser strands to said generally horizontal main wires,

the riser strand material being a smooth-surface synthetic degradable plastic material strong enough to support the plants during their normal growing season and subject to a loss of strength due to aging during said season between the time of installation of said riser strands and the harvesting of said hop vines such that said riser strands can be easily torn down at the harvest time; the material of the hooks being such that they will perform satisfactorily during several successive seasons.

4,050,188

SEEDLING GROWING CONTAINER

Aart van Wingerden, R.R. 2, Fletcher, N.C. 28732

Filed Mar. 1, 1976, Ser. No. 662,369
Int. Cl.² A01G *9/02*
U.S. Cl. 47—85 **7 Claims**

1. A seedling tray for separating and subsequently removing plants and their respective entire root system comprising:

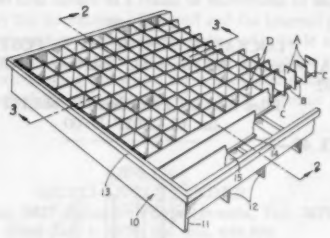
an open bottom tray having sidewalls and endwalls;

a number of spaced interior walls mounted within said tray; insert strip support means;

a removable insert strip adapted to be carried between adjacent interior walls by said support means;

said removable insert strip having spaced aligned sides mounted on an elongated bottom strip to define a series of compartments for containing said plants;

each of said compartments having a pair of opposed open sides between said aligned sides making each compartment accessible from a pair of opposed open sides to facilitate plant removal therefrom without shock; and



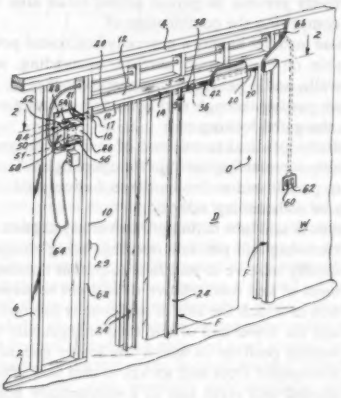
a channel open on one side formed in the bottom of each compartment to facilitate drainage therefrom.

4,050,189

DEVICE FOR OPERATING A POCKET DOOR

Francis C. Peterson, St. Louis County, Mo., assignor to C. Hager & Sons Hinge Manufacturing Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 473,003, May 24, 1974, abandoned. This application Sept. 4, 1975, Ser. No. 610,133
Int. Cl.² E05F *15/14*
U.S. Cl. 49—26 **14 Claims**



1. For use with a door mounted on a track and movable parallel to the track between open and closed positions relative to an opening in a wall, an improved apparatus for moving the door between its open and closed positions, said apparatus comprising: an electric motor mounted in a fixed position relative to the door opening and being connected with a drive pulley which the motor is capable of turning in either direction of rotation; an idler pulley spaced from the drive pulley; a cable looped around the drive and idler pulleys and attached to the door such that when the drive pulley is rotated in one direction, the door is urged to its open position, and when the drive pulley is rotated in the opposite direction, the door is urged to its closed position, the drive pulley being capable of slipping relative to the cable; and timing means which when actuated causes the motor to undergo a single door operating cycle wherein the motor first rotates the drive pulley for a predetermined span of time in the direction which urges the door to its open position and thereafter rotates the drive pulley for a predetermined span of time in the opposite direction which urges the door to its closed position, said predetermined spans of time being sufficient in duration to under normal circumstances completely move the door from one position to the other, said predetermined times being constant and completely independent of the door position, whereby the time the

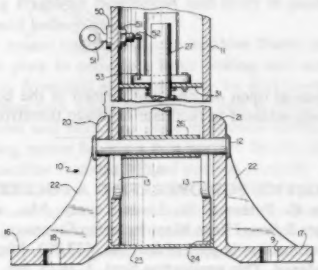
motor rotates the drive pulley in one direction and then in the other will be the same irrespective of the position of the door.

4,050,190

LOCKABLE OBSTRUCTION POST

Peter A. Mazzone, 395 Grove St., Apartment 1440, Reno, Nev. 89502

Filed Apr. 26, 1976, Ser. No. 680,143
Int. Cl.² E01F *13/00*
U.S. Cl. 49—35 **3 Claims**



1. An obstruction post mountable on a support surface to selectively prevent or permit access to an area adjacent the post comprising the combination of

a base member having a generally horizontal portion mountable on the support surface, upstanding, spaced apart walls, and a generally cup-shaped socket;

a pin passing through said walls and defining a pivot axis;

an elongated locking rod;

a sleeve attached to one end of said locking rod and rotatably surrounding said pin for coupling said rod to said pin to permit said rod to be pivoted about said pivot axis;

a tube surrounding said rod;

means in said tube defining transversely aligned openings for receiving said pin, said openings being elongated longitudinally relative to said tube to permit limited axial movement of said tube relative to said pin between a first position in which the axis of said tube is substantially vertical and the lower end of said tube engages said socket, and a second position in which the lower end of said tube is disengaged from said socket so that said tube is pivotable around said pivot axis to a substantially horizontal position;

first spring means for urging said tube axially toward said second position;

latch means within said tube and engageable with said rod for latching said tube in said first position,

said latch means comprising

a mounting plate fixedly attached to and movable with said tube and extending transversely across the interior of said tube, said plate having a central opening to slideably receive said rod,

a latch member pivotally mounted on said plate for motion in a plane perpendicular to the axis of said rod, and second spring means for urging said latch member toward said rod,

said rod having a recess to receive said latch member when said tube is moved to said first position; and

means for manually releasing said latch means including

a key-operated lock mounted in said tube, said lock having a portion within said tube which is rotatable from a locked position to an unlocked position by a key inserted into said lock from outside said tube; and

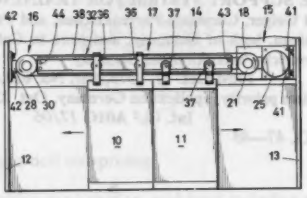
link means connected between said rotatable portion and said latch member for moving said latch member out of said recess when said portion is rotated.

4,050,191

KNOCKDOWN APPARATUS FOR SUPPORTING AND DRIVING OVERHUNG DOORS

Akira Azuma, Uozu, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Oct. 20, 1975, Ser. No. 624,228
Claims priority, application Japan, Oct. 21, 1974, 49-127200[U]
Int. Cl.² E05F *15/14*
U.S. Cl. 49—360 **3 Claims**



1. A door support apparatus for installation between a pair of side jambs of a doorframe to support and drive a suspended door, said apparatus comprising, in combination:

a. a drive assembly comprising,

1. a first bracket adapted to be removably fastened to one of said side jambs;

2. a drive wheel rotatably mounted on said first bracket; and

3. a drive mechanism mounted on said first bracket and drivably connected to impart rotation to said drive wheel;

b. a driven assembly comprising,

1. a second bracket adapted to be removably fastened to the other of said side jambs; and

2. an idler wheel rotatably mounted on said second bracket;

c. An endless flexible member interconnecting said wheels; and

d. a track assembly comprising,

1. a rail removably fastened at both ends to and supported by said first and second brackets to provide an overhead track for the door; and

2. at least a pair of door hangers in rolling engagement with said rail and adapted to suspend the door therefrom, said door hangers being attached to said endless, flexible member for moving the door along said track.

4,050,192

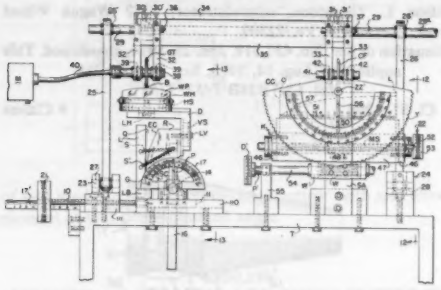
APPARATUS FOR FARMING OPHTHALMIC LENS FOR PRESBYOPIA AND APHAKIA

David Volk, 2460 Fairmount Blvd., Cleveland, Ohio 44106

Division of Ser. No. 535,519, Dec. 23, 1974, Pat. No. 4,002,439, which is a division of Ser. No. 322,488, Jan. 10, 1973, abandoned.
This application May 27, 1976, Ser. No. 690,615
Int. Cl.² B24B *13/04*
U.S. Cl. 51—33 R **11 Claims**

1. Apparatus for forming a convex front surface portion of variable curvature for use in the formation of spectacle lenses for correction of presbyopia and aphakia which surface is characterized by having a pair of orthogonal principal planes which intersect said front surface normally at all points, the first of said principal planes, generally horizontal, intersecting said front surface in a great arc, and the second of said principal planes, generally vertical, intersecting said front surface in a principal curve; comprising a base, a work-manipulating frame having a mounting on said base, a workpiece holder on said frame, a rotatable circular edged substantially planar abrading tool supported on mounting means above said frame with its axis parallel to said second plane and in position to cut a workpiece in said holder, means for rotating said tool, means on said frame for moving said workpiece holder incrementally

through the plane of said tool edge, cam means operatively associated with said moving means following the evolute of said principal curve, means mounting a conic-producing pattern on said base with a control point of said pattern at the level of the lower edge of said tool when said tool axis lies in said second plane, an oscillating frame pivotally mounted on said base on an axis parallel to said second plane, said mounting means for said tool being rigid with said oscillating frame, a cam follower circular in section rotatably mounted on a fixed



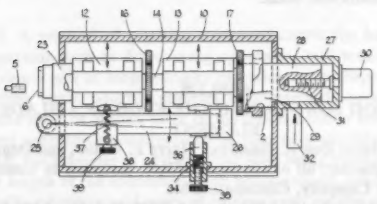
axis on said oscillating frame coaxial with said abrading tool, said follower being of the same diameter as said tool, said cam follower having its circular edge always in contact with said conic-producting pattern, said mounting means for said conic-producing pattern including means for moving said pattern to vary the eccentricity of said conic pattern projected on said first plane, and said mounting for said oscillating frame permitting oscillation of said tool edge completely across a workpiece in said holder.

4,050,193

GRINDING HEAD FOR MACHINING CONSTANT INTERNAL PROFILES

Jean Claude Bonin, Blois, France, assignor to Roto Diesel, Blois, France

Filed Jan. 7, 1976, Ser. No. 647,044
Claims priority, application France, Jan. 10, 1975, 75.00672
Int. Cl.[2] B24B *17/02*
U.S. Cl. 51—101 R **10 Claims**



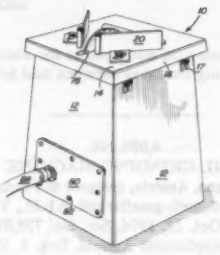
1. An attachment for a grinding machine having a movable work table and a rotary grinding wheel rotatable about a first axis the attachment comprising a support frame for mounting on said table, first means carried by the support frame for holding a component upon an internal peripheral surface of which a profile is to be machined, said first means rotating said component about a second axis parallel to the axis of rotation of said grinding wheel, second means carried by the support frame for holding a master having an internal profile corresponding to the desired profile of the component, said second means rotating said master about an axis coincident with said second axis, a detector roll engageable with the internal profile of said master, said detector roll being of varying diameter throughout its axial length, mounting means for said detector roll, said mounting means being arranged to permit rotation of said roll about a third axis inclined relative to the second axis by an amount such that the line of contact between the roll and said internal profile extends paralled to said second axis, connecting means for transmitting movement between said first and second means whereby homothetic motion will be imparted to said first means as a result of movement of said second means by the interaction of the roll and the internal profile of the master, said mounting means being adjustable so that when the diameter of said grinding wheel is changed as a result of dressing or changing the wheel the homothetic relationship of the motion of the grinding wheel and the detector roll is maintained.

4,050,194

MULTI-ANGLE SANDER

Jessie A. Rice, 8427 Jamestown Drive, Austin, Tex. 78758

Filed Jan. 5, 1976, Ser. No. 646,590
Int. Cl.[2] B24B *7/16*
U.S. Cl. 51—128 **5 Claims**



1. A multi-angle sander device comprising; a support structure, a removable top member on said support structure having a longitudinal aperture therein, a rotatably drive mounted within said support structure, sander means mounted on said rotatable drive and passing through said aperture for sanding angles on workpieces and running cool and not burning, and adjustable guide means mounted on the top member for guiding workpieces being sanded at the proper angle to the sanding means, the adjustable guide means includes at least one rectangular guide plate member pivotally mounted perpendicular to the surface of the top member and having a slotted adjusting flange integral therewith, and the adjustable guide means includes two of the pivotally mounted rectangular guide plate members and further includes an enlarged head locking screw guidingly mounted in the slot of the flanged member of each of the rectangular guide plate members and engaging with a screw-threaded member fastened in the removable top member for the purpose of positively locking the rectangular guide plate members once they are adjusted, and additional flat triangular shaped guide plates which complement the pivotally mounted rectangular guide plate members, said flat triangular shaped guide plates having adjusting apertures therein and being adjustably locked to the top member by enlarged head locking screws.

4,050,195

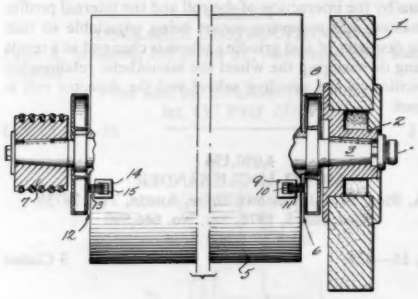
APPARATUS FOR COMPENSATING FOR UNBALANCE OF A ROTARY BODY

Dionys Hofmann, Darmstadt-Marienhohe, Germany, assignor to Gebr. Hofmann KG, Maschinenfabrik, Darmstadt, Germany

Filed Aug. 6, 1976, Ser. No. 712,359
Claims priority, application Germany, Aug. 30, 1975, 7527462[U]
Int. Cl.[2] B25B *41/04*
U.S. Cl. 51—169 **3 Claims**

1. In an apparatus for mounting a grinding wheel of the type having a spindle, means for rotating said spindle, means for mounting a grinding wheel on one end of said spindle and balancing means comprising an annular housing having a plurality of radially divided chambers, each chamber communi-

cating with a respective inlet at a different radial distance and means for injecting a balancing liquid into said body as a function of unbalance, the improvement comprising means for



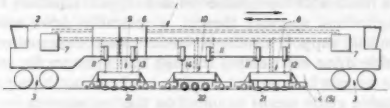
mounting said housing on said spindle for rotation therewith with said wheel being mounted between said housing and said end.

4,050,196

RAIL GRINDING MACHINE

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industrie-gesellschaft m.b.H., Vienna, Austria

Filed Oct. 22, 1976, Ser. No. 735,016
Claims priority, application Austria, Dec. 1, 1975, 9132/75
Int. Cl.[2] B24B *23/00*
U.S. Cl. 51—178 **16 Claims**



1. A mobile rail grinding machine for grinding the running surface and inside of the railhead of track rails, each track rail having a vertical plane of symmetry and respective halves of the running surface on each side of the plane of symmetry, comprising

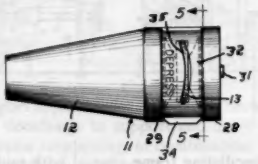
1. a forward and a rear grinding module spacedly arranged in an operating direction, each of the grinding modules including
   a. a carrier associated with each running surface half of each of the track rails,
   b. power-driven means for moving the carriers,
   c. two rotatable grinding wheels on each carrier associated with respective ones of the running surface halves, the grinding wheels being spaced in the operating direction and each of the wheels having a circumferential grinding surface arranged for grinding the associated running surface half of the railhead of the associated track rail, and
   d. track rail engaging elements guiding each grinding module along the track rails;
2. an intermediate grinding module arranged between the forward and rear grinding modules, the intermediate grinding module including
   a. a carrier associated with each of the track rails,
   b. at least one grinding wheel on each carrier associated with the inside of the railhead of the associated track rail for grinding the associated inside, and
   c. power-driven means for moving the grinding wheels of the intermediate grinding module parallel with respect to the track;
3. shaping tools on the carriers for profiling the grinding surfaces of the grinding wheels; and
4. means for centering the forward and rear grinding modules with respect to the track rails and for pressing the track rail engaging elements without play against the track rails they engage.

4,050,197

BLADE AND SCISSORS SHARPENER

Willis F. Thompson, deceased, late of Portland, Maine, by Nelson L. Thompson, administrator, 8347 Wagon Wheel Road, Alexandria, Va. 22309

Continuation of Ser. No. 437,319, Jan. 28, 1974, abandoned. This application Aug. 14, 1975, Ser. No. 604,788
Int. Cl.[2] B24B *3/52, 3/54*
U.S. Cl. 51—208 **9 Claims**



1. A blade sharpener comprising a holder including a pair of end wall members, a unit dimensioned to be a free but close fit between said walls and including an abrasive wheel the periphery of which is flat transversely considered, and a pair of blade supporting members, one at each side of said wheel and engageable by the side of a blade and downwardly inclined towards the wheel to enable one side of a blade to be seated thereon with the beveled edge of the other side of the thus held blade to be held in contact with the proximate side of the wheel, and axial supporting means between said end wall members and means for mounting said unit on said axial supporting means with a loose fit with respect thereto whereby said unit rotates as the thus held blade is reciprocted and is also free to wobble to a limited extent said blade supports of a diameter greater than that of the wheel and close to but below the upper edge of said wall members with the upper edges of said wall members each substantially in the plane inclusive of the thus positioned blade.

4,050,198

METHOD FOR SHAPING THE EDGE OF A BLADE ELEMENT

Louis S. Hales; Don R. Hamilton; Harry F. Weller, and Donald E. Burgbacher, all of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 564,066, April 1, 1975, Pat. No. 4,001,978. This application June 2, 1976, Ser. No. 692,124
Int. Cl.[2] B24B *1/00*
U.S. Cl. 51—281 R **6 Claims**

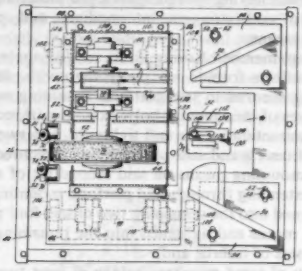
1. A method of shaping an edge of a blade having a leading edge and a trailng edge to a predetermined profile including:

presenting successive portions of one of said edges for engagement with an abrasive element by translating said blade relative to said abrasive element;

supporting and locating said blade such that said successive portions are presented to said abrasive element at a predetermined location;

guiding said blade by engaging said blade with a cam surface configured to represent the loci of a portion of said blade such that said successive portions of said one of said edges are presented to said abrasive element at a predetermined angle at said predetermined location; and

represent at least one of said loci which does not occupy the same point in space as other of said loci as successive portions



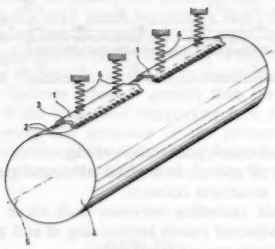
of said blade are presented for engagement with said abrasive element at said predetermined angle.

4,050,199

METHOD OF GRINDING A TOOTHED CUTTER FOR HAIR-CUTTING APPARATUS

Otto Meier, Klagenfurt, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 23, 1976, Ser. No. 679,804
Claims priority, application Austria, Apr. 28, 1975, 3279/75
Int. Cl.[2] B24B *1/00*
U.S. Cl. 51—285 **3 Claims**



1. A method of grinding a toothed cutter for hair-cutting apparatus such as dry-shaving apparatus, said toothed cutter having a pair of longitudinally extending strip-shaped rows of cutting teeth, which comprises simultaneously pressing both entire rows of cutting teeth of the toothed cutter into engagement with the circumferential surface of a rotating grinding shaft, the diameter of said grinding shaft being great relative to the length of the individual teeth being ground, while longitudinally orienting said rows of cutting teeth parallel to the axis of the grinding shaft.

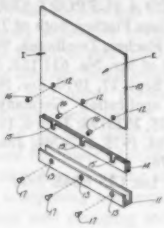
4,050,200

REMOVABLE HATCH STRUCTURE FOR AUTOMOBILES

Edward G. Beck, Jr., Fort Thomas, Ky., assignor to The Stolle Corporation, Sidney, Ohio

Filed Dec. 27, 1976, Ser. No. 754,102
Int. Cl.[2] E04B *7/18*; E04C *2/00*
U.S. Cl. 52—19 **4 Claims**

1. An assembly of a rigid sheet and rigid linear member, said linear member being in the form of a channel having a plurality of holes through one leg only thereof, said rigid sheet having a like number of holes aligned with the holes in said channel, a gasket member of compressible material in said channel extending between said channel walls and both sides and the edge of said sheet seated in said channel, and having openings aligned with said holes, and expandable shank rivets extending



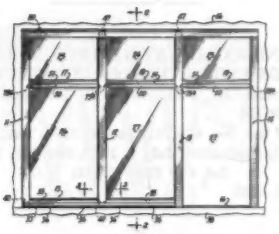
into said aligned holes and lockingly securing said sheet in said channel.

4,050,201

WALL CONSTRUCTION HAVING A CONTINUOUS SILL WITH GUTTER MEANS

S. Eugene Hubbard, Niles, Mich., and Lawrence F. Biebuyck, Mesquite, Tex., assignors to Kawneer Company, Inc., Niles, Mich.

Continuation of Ser. No. 197,738, Nov. 11, 1971, abandoned, which is a division of Ser. No. 41,951, June 1, 1970, abandoned. This application Oct. 15, 1973, Ser. No. 406,212
Int. Cl.[2] E06B *7/14*
U.S. Cl. 52—97 **5 Claims**



1. A base assembly for a wall construction having a vertical mullion with at least one glazing pocket in its side face, said base assembly comprising:

continuous sill means extending along the base of said wall construction and having upstanding leg portions onto which said vertical mullion rests and including portions defining spaced clip positioning shoulders,

a gutter means snapped on said sill means, said gutter means having one end butt fitted against said side face of said vertical mullion, and

a clip means resting on said sill means and engaged with said vertical mullion between said clip positioning shoulders, said clip means having upstanding leg portions abutting against the side wall of said glazing pocket of said vertical mullion.

4,050,202

METHOD AND ARRANGEMENT FOR ANCHORING AN OBJECT TO A SUPPORT STRUCTURE

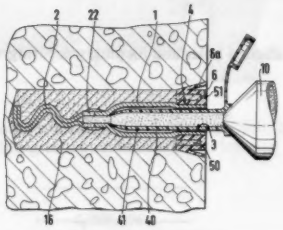
Artur Fischer, and Klaus Fischer, both of Tumlingen, Germany, assignors to Artur Fischer, Tumlingen, Waldachtal, Germany

Continuation-in-part of Ser. No. 631,153, Nov. 11, 1975. This application Sept. 17, 1976, Ser. No. 725,138

Claims priority, application Germany, Nov. 14, 1974, 2453957; May 26, 1975, 2523198; June 6, 1975, 2525220; June 7, 1975, 2525452; June 14, 1975, 2526744; June 21, 1975, 2527773; Sept. 19, 1975, 2541762

Int. Cl.² E04B *1/41*

U.S. Cl. 52—127 **10 Claims**



1. An arrangement for securing an object to a support structure having an anchoring hole, comprising an anchoring element having one part of transverse dimensions smaller than, and another part of transverse dimensions substantially corresponding to those of the anchoring hole, said anchoring element being insertable into the anchoring hole through an open end thereof so that said other part supports said anchoring element at the open end of the anchoring hole with clearance between the latter and said one part and closes the open end of said clearance upon insertion; means for introducing a body of hardenable material into said clearance for hardening therein about said one part of said anchoring element to thereby anchor the latter in the anchoring hole; and means for monitoring the degree of filling of said clearance by the hardenable material, including at least a translucent portion of said other part of said anchoring element through which said clearance and said body can be observed.

4,050,203

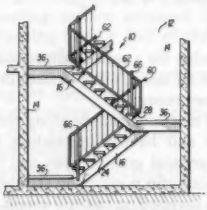
STAIRS AND RAILING SYSTEM FOR MULTI-FLOORED BUILDINGS AND METHOD OF CONSTRUCTING SAME

Thomas Souza, Jr., P.O. Box 579, 145 Hekili St., Kailua, Hawaii 96734

Division of Ser. No. 646,762, Jan. 6, 1976, Pat. No. 3,994,113. This application July 1, 1976, Ser. No. 701,631

Int. Cl.² E04F *11/00, 11/18*

U.S. Cl. 52—185 **10 Claims**



1. A stairs for multi-floored buildings having a walled stairwell, said stairs comprising:
   1. a first set of parallel, spaced apart stringers having platform mounting means integrally formed with and extending a distance from each end thereof;
   2. a second set of parallel, spaced apart stringers also having platform mounting means integrally formed with and extending a distance from each end thereof, said second set of stringers being positioned adjacent said first set and extending opposite thereto, said first and second set of stringers each having spaced apart tread mounting means secured to said stringers intermediate said platform mounting means;
   3. a platform member having four sets of spaced apart threaded inserts formed integrally therewith, said platform being secured to said platform mounting means on said first set of stringers by bolts extending through said platform mounting means and tightened into two of said four set of inserts and said platform being secured to said platform mounting means on said second set of stringers by bolts extending through said platform mounting means and tightened into the remaining two of said four platform mounting means and tightened into the remaining two of said four sets of inserts; and
   4. a plurality of tread members having at least two spaced apart threaded inserts formed integrally therewith, said tread members being secured to said tread mounting means by bolts extending through said tread mounting means and tightened into said inserts.

4,050,204

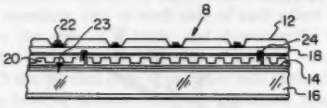
CONTROLLED DESTRUCTIVE PANEL ASSEMBLY

Harley D. Scott, Wexford, Pa., assignor to Cyclops Corporation, Pittsburgh, Pa.

Filed Apr. 30, 1976, Ser. No. 681,820

Int. Cl.² E04B *1/00*

U.S. Cl. 52—262 **10 Claims**



1. A wall panel construction comprising:
   A. a plurality of spaced, horizontal structural girts secured to vertical, structural columns;
   B. liner panels extending between each three girts with vertically adjacent panels terminating at end girts of the three in slightly spaced relationship;
   C. a plurality of spaced, horizontal subgirts secured to the liner panels with certain of the subgirts positioned on either side of the end girts;
   D. exterior panels extending between each of said three girts and connected to the subgirts with vertically adjacent panels overlapping in unattached relationship;
   E. a clip having angular flanges and secured to said end girts between the adjacent spaced liner panels, the flanges of said clip pinching the adjacent liner panels against the end girts;
   F. means to attach the liner panels to a middle girt of the three girts;

whereby an external force of predetermined magnitude against the wall panel construction causes the adjacent liner panels to deform about the middle girt as the liner panels pivot about and release from the clip flanges while simultaneously the overlapping, exterior panels pivot and release at their overlapping ends.

4,050,205

PROTECTIVE SHIELD FOR UTILITY OPENING IN A BUILDING FRAMING MEMBER

John P. Ligda, 53767 Kristin Court, Utica, Mich. 48087

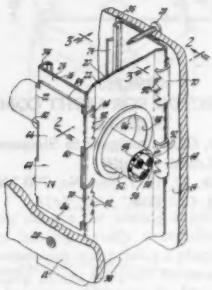
Continuation of Ser. No. 605,344, Aug. 18, 1975, abandoned. This application Dec. 6, 1976, Ser. No. 747,963

Int. Cl.² E04C *3/16;* E02D *35/00*

U.S. Cl. 52—357 **10 Claims**

1. A protective shield adapted to overlie the wall panel

supporting face of a building framing member and prevent a wall panel fastener of the self-drilling type from entering a utility service opening provided in the framing member, said protective shield comprising: a generally planar body portion having opposed side edges defining a width sufficient to overlie substantially the full width of the wall panel supporting face of the framing member and upper and lower edges defining a length sufficient to overlie substantially the full extent of the utility service opening, and fastening clips means integral with the body portion and projecting generally perpendicularly from the opposed side edges thereof, said fastening clips being adapted for outward camming action during forced installation



of the protective shield over the face of the framing member and adapted for resilient clamping engagement on the building framing member to attach the body portion in juxtaposed relation with the wall panel supporting face of the building framing member and in overlying alignment with the utility service opening, said body portion being of material and thickness effective to provide resistance to penetration by the self-drilling type fastener which is greater than the resistance to penetration of the wall panel supporting face of the framing member whereby the presence of the protective shield is sensed and insertion of the self-drilling fastener is terminated prior to entry of the self-drilling fastener into the utility service opening.

4,050,206

EXPANSION JOINTING MATERIAL FOR PLACING CONCRETE, MORTAR OR THE LIKE

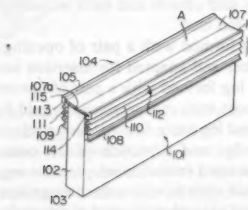
Akira Utsuyama, No. 2-22, Toyotama-Kita, Nerima, Tokyo, Japan

Filed Aug. 5, 1975, Ser. No. 601,984

Claims priority, application Japan, Nov. 26, 1974, 49-143555[U]

Int. Cl.² E01C *11/10*

U.S. Cl. 52—396 **16 Claims**



1. A joint forming and sealing assembly adapted to be laid in place on a surface prior to forming a slab of concrete or mortar, comprising: an elongated elastic compressible jointing member having substantially the shape of a board and having upper and lower edges and opposite sides; a plurality of support assemblies located at selected longitudinally spaced-apart positions along said jointing member, each support assembly comprising an upper portion of inverted substantially U-shape cross section and a pair of support legs extending downwardly from said upper portion and diverging with respect to each other, the lower ends of said support legs being adapted to rest on said surface and being adjustable toward and away from each other to adjust the height of said upper portion, the upper portion of said jointing member being snugly received within and substantially filling said upper portion of said support assembly and being compressed thereby, said support legs diverging away from the opposite sides of said jointing member in a direction toward the lower edge thereof; and an elongated cover member extending along the entire length of said jointing member and comprising a clamping section and an elastic reference section, said clamping section comprising a pair of downwardly extending legs snugly sleeved on the exterior of said upper portions of said support assemblies and extending downwardly therealong substantially to the positions at which said support legs begin to diverge, said legs of said clamping section also snugly contacting the opposite sides of said jointing member in the zones between the support assemblies, said reference section projecting upwardly from said clamping section and defining at its upper end a pair of longitudinally extending reference surfaces for use in smoothing the surface of the concrete or mortar, said support assemblies and said cover member having interengaging means for releasably coupling same together.

4,050,207

EXPANSION GAP SEALING DEVICE

Silvio Bertschmann, Meggen, Switzerland; Waldemar Koester, Forsbach, Germany, and Reinhold Huber, Rorbas, Switzerland, assignors to Firma Friedrich Maurer Soehne, Munich, Germany

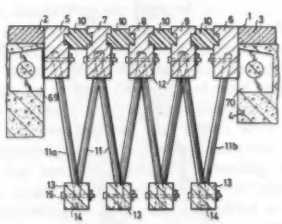
Continuation of Ser. No. 308,452, Nov. 21, 1972, Pat. No. 3,904,302. This application Jan. 24, 1975, Ser. No. 543,779

Claims priority, application Germany, Apr. 10, 1972, 2217151

The portion of the term of this patent subsequent to Sept. 9, 1992, has been disclaimed.

Int. Cl.² E04B *1/68*

U.S. Cl. 52—396 **31 Claims**



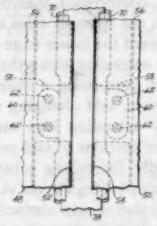
1. In an expansion gap sealing device for bridging an expansion gap between edges of structural members, wherein rigid gap strips and elastic strips are alternately arranged to extend in parallel to each other and longitudinally inside the gap, said rigid and elastic strips forming an expansion and sealing assembly which is connected along its outer sides to the edges of the gap, and which is carried by supporting structure means variable in its length across the gap and connected on both sides to the edges of the gap, the improvement wherein said supporting structure means comprises at least two supporting legs each having an upper end and a lower end, first means connecting said upper leg ends to said rigid gap strips so that the legs extend downwardly into the gap, and second holding means to which said lower legs are connected to form an elastically yielding supporting structure.

4,050,208

AIRCRAFT INTERIOR CEILING PANEL ASSEMBLY AND ATTACHMENT APPARATUS

Arturo Pompei, Rome, Italy, and Alden Bernard Winters, Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Oct. 4, 1976, Ser. No. 729,438
Int. Cl.[2] E04C *1/28;* B64C *1/00*
U.S. Cl. 52—460 8 Claims



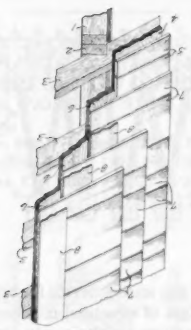
1. A ceiling panel assembly adapted to be attached to a supporting structure comprising:
   a plurality of ceiling panels having gaps therebetween and each panel having a plurality of edges;
   gap cover guides attached to the panels near the edges;
   gap covers extending between the guides on adjoining panels and urged into contact with the panels by the guides; and,
   attachment brackets mounted near the edges of the panels for attaching the panels to the supporting structure at points in between said panels and above said gap covers.

4,050,209

PREFABRICATED SHINGLE PANELS

Frank S. Barker, deceased, late of Pompano Beach, Fla. by Bayetta Barker, executrix; Willis G. Pehl, Chehalis, Wash., assignors to Shakertown Corporation, Winlock, Wash.

Continuation of Ser. No. 573,437, May 1, 1975, abandoned, which is a continuation of Ser. No. 48,255, June 22, 1970, abandoned. This application May 17, 1976, Ser. No. 687,344
Int. Cl.[2] E04D *1/20*
U.S. Cl. 52—478 17 Claims



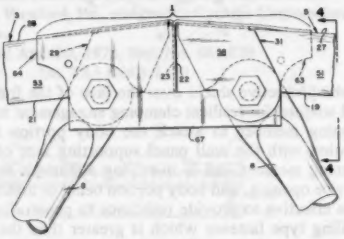
1. An assembly of prefabricated shingle panels in which each panel includes a backing board and a course of several wooden shingles, each shingle having a tip portion and a butt portion and being tapered in thickness away from said butt portion toward said tip portion, said shingles being arranged with their lengths extending transversely to the length of said backing board, with their tip portions overlying and secured to said backing board and with their butt portions overhanging one edge of said backing board in free cantilever fashion for a distance at least as great as the width of said backing board, each of said backing boards being of a horizontal lengths as great as the width of several shingles, the backing boards of adjacent upper and lower shingle courses being in edge-adjacent, substantially coplanar, nonoverlapping relationship, the overhanging shingle butt portions in each panel overlapping shingle tip portions and completely overlapping the width of the backing board of the panel in the next lower course, and a strip of flexible waterproof material of a length at least equal to the width of several shingles and having its length extending generally parallel to the length of a backing board, interposed between the overhanging butt portions of the shingles in one course and the tip portions of the shingles on the backing board of the next lower course, such strip being overlapped by such overhanging shingle butt portions.

4,050,210

RIDGE CONNECTOR FOR LIGHT COMPOSITE TRUSSES

Tyrell Gilb, Berkeley, Calif., assignor to Simpson Manufacturing Co., Inc., San Leandro, Calif.

Filed Feb. 22, 1977, Ser. No. 770,700
Int. Cl.[2] E04C *3/02, 5/18*
U.S. Cl. 52—639 5 Claims



1. A ridge connector for light trusses having abutting wood top chords and metal webs having openings therein comprising:
   a. each of said chords is formed with a transverse semi-circular groove across its inside face adjacent its abutting end and slots joining said inner and outer faces at the approximate center lines of said chords,
   b. a pair of U-shaped grip-groove connectors formed with legs and mounted on said ends of said chords with one leg extending through said chord slot and one leg engaging the side of said chord and each grip-groove connector having an opening adjacent the end of each of said connector legs;
   c. a pair of U-shaped ridge connectors connecting the abutting ends of said chords and each including:
      1. an elongated base.
      2. a first leg formed with a pair of openings spaced from one another and adapted for insertion into said slots.
      3. a second leg formed with a pair of openings positioned in alignment with said openings in said first leg.
      4. said second leg has a first extension adapted for engaging the edge and a portion of the outer face of said chord, a second extension adapted for engaging the butt ends of said chords, and a third extension connected to said second extension adapted for engaging a portion of the outer face of one of said chords.
   d. a pair of pins inserted through the openings in said grip-groove connectors and said U-shaped ridge connectors and adapted for engaging said semi-circular grooves in said chords and said openings in said webs; and
   e. said U-shaped ridge connectors are mounted in side by side relation with said second extensions in alignment between the butt ends of said chords.

4,050,211

COUPLING DEVICE FOR JOINING TOGETHER REINFORCED CONCRETE ELEMENTS, SUCH AS CONCRETE PILES OR PILLARS

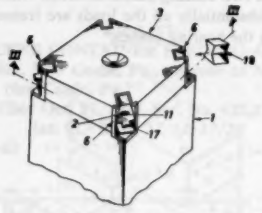
Lorentz Wahman, Viktoriagatan 32, Goteborg, Sweden (411 25)

Filed Dec. 3, 1975, Ser. No. 637,193

Claims priority, application Sweden, Dec. 12, 1974, 7415568; June 13, 1975, 7506781

Int. Cl.[2] E04C 3/30; E02D 35/00

U.S. Cl. 52—726 12 Claims



1. A coupling device for joining together reinforced concrete segments having axially protruding reinforcing rods extending therethrough comprising a plurality of pairs of separate first coupling means adapted to be secured to opposing faces of two concrete segments to be coupled together in register, each of said first coupling means being secured to the end of at least one axially protruding reinforcing rod, the number of first coupling means equaling the number of axially protruding reinforcing rods, and a plurality of second coupling means received in said first coupling means for axially and laterally coupling together said pairs of first coupling means and therewith said concrete segments.

4,050,212

PROFILE STEEL

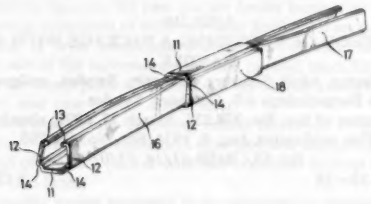
Franz Gantke; Harald Walter, and Walter Zywietz, all of Dortmund, Germany, assignors to Hoesch Werke Aktiengesellschaft, Dortmund, Germany

Filed Nov. 8, 1976, Ser. No. 739,641

Claims priority, application Germany, Nov. 11, 1975, 2550577

Int. Cl.[2] E04C 3/30

U.S. Cl. 52—726 2 Claims



1. A structural frame member, especially for use in connection with the building of mine shafts and tunnels, which includes: two channel-shaped profile steel elements each of which comprises a bottom with lateral steps and lateral webs respectively forming extensions of said steps and being inclined toward each other while extending in a direction away from said bottom, the free ends of said webs forming flanges facing each other, each of said two profile steel elements having the lateral web portions at one end thereof bent together while the bent together web portions of one profile steel element are in alignment with and substantially abut the bent together web portions of the other profile steel element; and a third channel-shaped profile steel element corresponding in shape substantially to the shape of said first mentioned two channel-shaped profile steel elements but without bent together web portions, said third channel-shaped profile steel element in an upside down position with regard to said other two channel-shaped profile steel elements being common to and straddling said abutting and bent together web portions and holding them together, the inner surfaces of the flanges of said third channel-shaped profile steel element corresponding to the outer surfaces of said steps of said first mentioned two channel-shaped profile steel elements, and said flanges of said first mentioned two channel-shaped profile steel elements resting against the inner surface of the bottom of said third channel-shaped profile steel element, while the webs of said third channel-shaped profile steel element rest against the webs of said first mentioned two channel-shaped profile steel elements in the region of the steps thereof, and while the flanges of said third channel-shaped profile steel element rest against the outer surfaces of the steps of said first mentioned two channel-shaped profile steel elements.

4,050,213

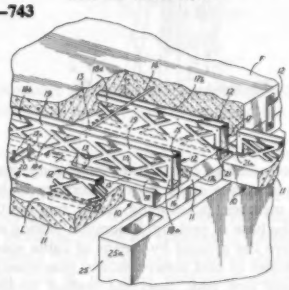
METHOD OF ERECTING A MULTI-STORY BUILDING

Thomas J. Dillon, Akron, Ohio, assignor to Thomas J. Dillon & Co., Inc., Cleveland, Ohio

Continuation of Ser. No. 29,508, April 17, 1970, abandoned. This application Sept. 5, 1972, Ser. No. 286,443

Int. Cl.[2] E04B 1/35

U.S. Cl. 52—743 1 Claim



1. A method of erecting a multi-story building on a prepared foundation site, comprising the steps of

A. erecting a plurality of pre-cast concrete wall panels in horizontally aligned, parallel relationship with each other, with each panel forming one wall of a room of said building and having at least one vertical void extending between the top and bottom surfaces thereof;

B. spanning adjacent parallel wall panels with a series of partial thickness pre-cast concrete floor slabs of uniform thickness that have longitudinally extending reinforcing girder-like means provided therein, with at least a portion of said reinforcing means being embedded in said floor slabs projecting inwardly from the upper surface thereof and with opposed ends of said floor slabs resting on the top edges of said wall panels and being spaced from the ends of the slabs spanning the next adjacent pair of wall panels;

C. transversely and longitudinally aligning the longitudinal ends of said floor slabs in non-covering relationship to said voids in said walls panels;

D. securing by first securing means each said slab against lateral movement with respect to a laterally adjacent slab;

E. securing by second securing means said longitudinally aligned floor slabs against longitudinal movement with respect to he longitudinally aligned slabs that are supported on said panels on the opposite side of said voids;

F. pouring a substantially uniform thickness layer of concrete in situ onto the upper surface of said aligned slabs and into said voids so as to cover said slabs, said reinforc-

ing means and said positioned first and second securing means and simultaneously fill said voids with a column of site-poured concrete from top to bottom thereof and thereby effectuate concrete fusion between said wall panels and said floor slabs whereby a monolithic structure is formed; and

G. prestressing at least the portion of said reinforcing means that is embedded in said partial thickness floor slabs.

4,050,214

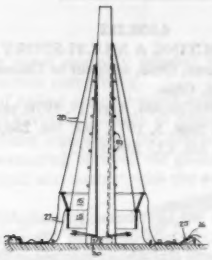
METHOD OF ERECTING A TOWER STRUCTURE

Roy W. P. Johnson, Greenwich, Conn., assignor to Tower Technology, Inc., Minneapolis, Minn.

Division of Ser. No. 541,587, Jan. 16, 1975, Pat. No. 3,994,108. This application July 22, 1976, Ser. No. 707,757

Int. Cl.[2] E04B *1/35;* **E04H** *5/12, 12/00*

U.S. Cl. 52—745 **4 Claims**



1. Method of erecting a structure comprising: positioning a series of sheave means at each of a plurality of levels on a vertical rigid member, positioning a first ring on the ground surrounding the base of said rigid member, raising said ring to a position above the ground by means of cable means reeved through one series of said sheave means, positioning a second ring below said first ring, inserting sealing means between adjacent circumferential ends of said rings to seal the same, raising said first and second rings by means of cables reeved through said one series of sheave means and a second lower series thereof, respectively, repeating said steps adding rings until said first ring reaches the desired height, and anchoring said cables.

4,050,215

PREMANUFACTURED MODULAR HOUSING BUILDING CONSTRUCTION

John Sergio Fisher, 2102 Euclid Ave., Syracuse, N.Y. 13224

Continuation of Ser. No. 243,750, April 13, 1972, abandoned, which is a continuation-in-part of Ser. No. 36,175, May 11, 1970, abandoned. This application Apr. 8, 1974, Ser. No. 458,673

Int. Cl.[2] E04B *1/348*

U.S. Cl. 52—79.3 **18 Claims**

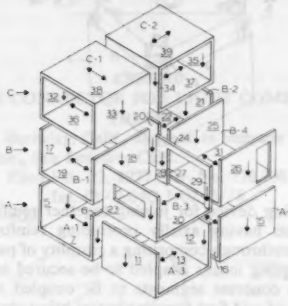
1. A modular building construction system including in combination:

a series of room-size rectangular first modules, each having in assembly only two vertical bearing planes parallel to each other, each said bearing plane having a plurality of vertical load-bearing structural members joined by a rectangular floor panel having a series of load-carrying spanning means running between said bearing planes, each said first module having said floor panel terminated at two sides at non-bearing planes, each said module being open on top, and

a series of room-size rectangular second modules, each having only two vertical bearing planes parallel to each other and provided with a plurality of vertical load-bearing structural members and joined by both a rectangular floor panel and a rectangular ceiling panel, both of which have a series of load-carrying spanning means running between their said bearing planes and both of which have two sides terminated at non-bearing planes,

a plurality of said modules being used at each story of a plural-story structure made by stacking some modules on others, each module of each upper story being placed on a module of a lower story with the bearing planes of those modules aligned to carry their load vertically,

means associated with each said floor panel and with each said ceiling panel for transferring the load from the said panel to the two bearing planes between which it extends, whereby substantially all the loads are transmitted vertically along the bearing planes,



said second modules being used only at the top of a vertical stack of said modules and the first modules being used on all stories except the top of said stack, and the floor panel for any one upper module forming a ceiling panel for a module on a lower story so that redundancy of floor-ceiling structure is avoided,

each said bearing plane of any one said module being perpendicular to the bearing planes of each adjacent module on the same story and adjacent a non-bearing plane side of said adjacent module, so that redundancy of bearing planes from module to module can be avoided and thereby, where walls are used at bearing planes, redundancy of such walls can be avoided and earthquake resistance of the building is enchanced.

4,050,216

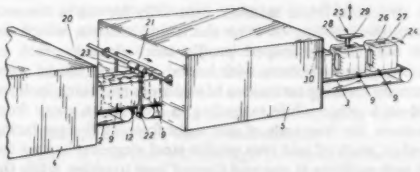
METHOD OF PROVIDING A PACKAGE WITH A HANDLE

Folke Gustav Adolf Stenberg, Kungalv, Sweden, assignor to Iwema Forpacknings AB, Goteborg, Sweden

Continuation of Ser. No. 238,235, March 27, 1972, abandoned. This application Aug. 8, 1974, Ser. No. 495,795

Int. Cl.[2] B65B *61/14, 53/02*

U.S. Cl. 53—14 **5 Claims**



1. The method of manufacturing an article-enclosing package and carrier handle comprising the steps of arranging the articles in a desired packaging pattern, wrapping a film of shrinking type plastic around said articles, overlapping the

longitudinal side edge portions of said film, heat sealing said overlapping side edge portions to form an elongate reinforced section of said package, and forming two longitudinal slits in said package in parallel relationship to the elongate reinforced section and on opposite sides thereof to form a strip integral with said reinforced section and suitable for use as a carrying handle, the longitudinal slits being formed of lesser length than the length of the reinforced section for transferring loads from the carrying handle to the remaining film through a portion of the reinforced section.

4,050,217

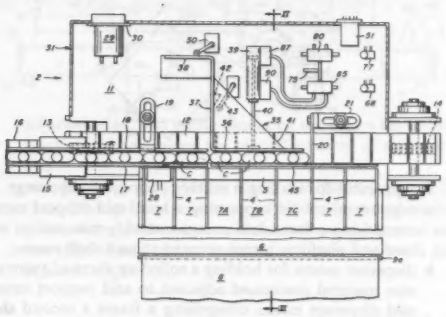
CASE PACKER CONTAINER FEEDING APPARATUS

Frank P. Alduk, New Castle, Pa., assignor to Newcastle Company, Inc., New Castle, Pa.

Filed Oct. 17, 1975, Ser. No. 623,379

Int. Cl.[2] B65B *57/14, 57/20*

U.S. Cl. 53—62 **10 Claims**



1. For use with a case packer having a belt conveyor of a length sufficient to accommodate more than a single case load lot of containers thereon at one time with a receiving end and at discharge end and a plurality of spaced paralell partitions extending thereover from end-to-end providing a plurality of parallel lanes along which containers travel from one end of the conveyor to the other, there being a dump tray at the discharge end of the conveyor onto which the containers are collected in single case lots with the containers arranged in longitudinal and transverse rows, the dump tray being operable to discharge each case load before the next one starts to accumulate thereon, the case packer feeder being operable for depositing containers of either circular horizontal section or of elliptical or oval horizontal section on the case conveyor feeder belt of the successive rows and parallel lanes for assembly on the dump plate of the case packer in case lots of uniform pattern, said case packer comprising:

a. an intermittently operating feeder conveyor arranged to move a row of containers into position at the receiving end of the case packer with one container in front of each of said lanes,

b. counter means arranged to be actuated by containers on the feeder conveyor to stop said feeder conveyor when a row of containers has been carried by the feeder conveyor into position where one container of the row is aligned with one of the lanes of the case packer,

c. a pusher arranged to push the containers in each such row into the respective lanes of the case packer in front of which the containers are positioned during the time the feeder conveyor is stationary, and then retract, said counter means having a counter switch located along the feeder conveyor in advance of the pusher and arranged to be activated by each container on the feeder conveyor as it is carried by the belt past the switch, and

d. switch means positioned to be operated by the dump tray of the case packer arranged to stop the case packer feeder belt when the dump tray is operating to discharge a case load of cartons therefrom and restore operation of the feeder conveyor when the dump tray is in position to receive containers from the case packer belt conveyor.

4,050,218

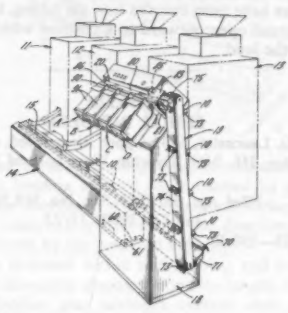
COIN ROLL PACKAGING SYSTEM

Daniel D. Call, Sarona, Wis., assignor to Cummins-Allison Corporation, Glenview, Ill.

Filed Dec. 22, 1975, Ser. No. 643,368

Int. Cl.[2] B65B *5/10*

U.S. Cl. 53—167 **19 Claims**



19. An automatic packaging system for coin rolls formed by wrapping machines, said system comprising the combination of

a. a conveyor for transporting coin rolls in seriatim in the direction of the axes of the rolls, and

b. a plurality of packaging stations adjacent the conveyor for receiving coin rolls from the conveyor, each packaging station including means for positioning the last coin roll at a completely filled packaging station to shunt all succeeding coin rolls to the next packaging station along the conveyor.

4,050,219

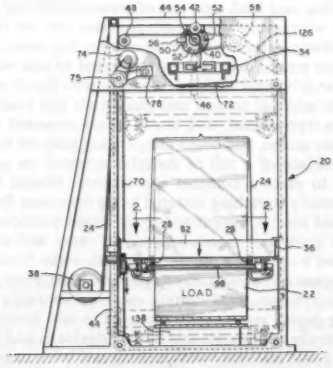
BAGGING MACHINE

David M. Higgins, Arlington Heights, Ill., assignor to Comptex, Inc., Chicago, Ill.

Filed Feb. 19, 1976, Ser. No. 659,587

Int. Cl.[2] B65B *9/10, 43/30*

U.S. Cl. 53—183 **20 Claims**



1. An improved bagging machine for covering a load with a bag formed from tubing of the type having

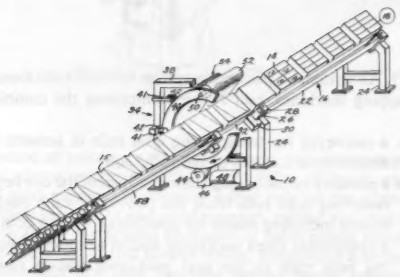
means for feeding tubing to a work area for receiving the tubing,
means for gripping the tubing, and spreading the tubing to an open position,
fingers which are insertable into the tubing which has been spread open,
means for severing the tubing and forming the bag therefrom, the bag being collected on the fingers,
and means for providing relative vertical movement between the fingers and the load to cover the load with the bag collected on the fingers, wherein the improvement comprises:
means for retracting the fingers simultaneously along mutually perpendicular horizontal components so that after the fingers have been inserted into the tubing, the tubing may be spread open outward to a position which will encompass the load.

4,050,220

SPIRAL BUNDLER

William G. Lancaster, 5101 Upper River Road, and Patrick R. Lancaster, III, 9410 Tiverton Way, both of Louisville, Ky. 40222

Filed Apr. 15, 1975, Ser. No. 568,269
Int. Cl.[2] B65B *13/12*
U.S. Cl. 53—198 R **11 Claims**



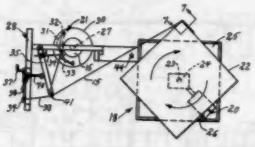
1. Apparatus for wrapping a plurality of loads and unitizing the loads into wrapped packages; comprising conveyor means adapted to receive a plurality of loads; each said load comprising a plurality of members, wrapping means positioned adjacent said conveyor means, said wrapping means comprising a frame, a circular roll dispenser means rotatably mounted on said frame, and guide wrapping rails axially aligned with said conveyor means adapted to receive said load from said conveyor means and substantially support said loads, said roll dispenser means being adapted to hold a roll of material and wrap said material around a load and guide wrapping rails supporting said load, said roll of material defining a path during the wrap cycle which path provides that the roll of material is always a constant distance from the center of the roll dispenser means, drive means connected to said roll dispenser means to drive said roll dispenser means so that it continuously deposits material around said guide rails and loads to form a spiral wrapped load, and brake means mounted to said roll dispenser means, said brake means being adapted to engage the outer surface of a roll of material mounted on said roll dispenser to place a constant and uniform tension on said rail substantially stretching material being dispensed from said roll onto said load; a second conveyor means positioned adjacent to said guide rail means adapted to carry said continuously wrapped bundle of a plurality of loads away from said wrapping means and cutting means positioned adjacent said second conveyor means, said cutting means comprising a frame, a cutting device reciprocally mounted in said frame and means to vertically reciprocate said cutting device in said frame to cut through said material overwrapping said loads to separate each load into a wrapped unitary package, said cutting means being operable in two directions such that a first separation is performed by the downward movement of said cutter means between the spacing formed between the loads and a second separation is performed by the subsequent upward movement of said cutting means between the immediately following spacing formed between the loads, and sensor means positioned next to said frame comprising light transmission means adapted to transmit light through said material overwrap to sense the spacing between loads, said spacing when sensed by said sensor means causing activation of said cutting means.

4,050,221

STRETCH-WRAPPED PACKAGE, PROCESS AND APPARATUS

Patrick R. Lancaster, III, and William G. Lancaster, both of Louisville, Ky., assignors to Lantech, Inc., Louisville, Ky.

Division of Ser. No. 347,873, April 4, 1973, Pat. No. 3,867,806.
This application July 30, 1974, Ser. No. 493,050
Int. Cl.[2] B65B *11/04*
U.S. Cl. 53—211 **5 Claims**



1. Apparatus for making a unitary package comprising:
a. support means for supporting a load; said support means comprising a base, shaft means rotatably mounted to said base and platform means secured to said shaft means;
b. dispenser means for holding a rolled-up sheet of a stretchable material positioned adjacent to said support means; said dispenser means comprising a frame a second shaft means rotatably mounted to said frame, said second shaft means being adapted to hold said rolled-up sheet of a stretchable material;
c. drive means connected to said support shaft means for rotating said support means, said drive means being adapted to effect relative movement between said support and dispenser means to cause a sufficient amount of said material to be dispensed from said dispenser means when interconnected by said stretchable material to overwrap said load; and
d. brake means connected to said dispenser second shaft means, said brake means being adapted to assume a plurality of positions relative to said second shaft means including a first position spaced away from said second shaft means for effecting substantially unrestricted movement of said material from said dispensing means to said load when said dispensing means is rotated and a second position of engagement with said second shaft means for restricting subsequent continuation of material movement from said dispenser means to said load while said dispenser means is being rotated so that said material will then be stretched permitting a sufficient amount of said stretched material to be dispensed from said dispenser means to provide a band comprising plural layers of said material around said load.

4,050,222

ENVELOPE OPENING APPARATUS

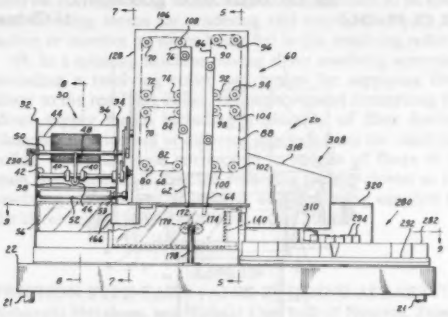
Frederick N. Stephens, Paola; Glenford Rowlett, Prairie Village, both of Kans., and James D. Beard, Independence, Mo., assignors to Stephens Industries, Inc., Lenexa, Kans.

Filed Aug. 29, 1975, Ser. No. 608,847
Int. Cl.[2] B65B *69/00*
U.S. Cl. 53—381 R **30 Claims**

1. Apparatus for opening an envelope previously slit along one edge thereof, comprising:
a pair of blades;

means for positioning the envelope with said one edge thereof adjacent said blades;

means mounting said blades for movement along respective paths, each including a first portion extending from a point outside the envelope to a second point within the envelope and a second and rectilinear portion extending from said second point through an edge of the envelope adjacent said one edge to a predetermined third point beyond said



adjacent edge, said means mounting the blades for translational movement along the second portions of said paths; and

means for driving the blades along said paths with a sufficient driving force to move said blades from said second points through the edges of the envelope adjacent to said one edge to said predetermined third points to break said adjacent edges.

4,050,223

DEVICE FOR UNPACKING BOTTLES OR SIMILAR ARTICLES IN A SHRINK FOIL PACKAGE

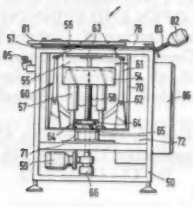
Emil Steeg, Budenheim, and Uwe Hoffmeyer, Mainz, both of Germany, assignors to Autonation Steeg and Hoffmeyer GmbH, Budenheim, Germany

Filed June 4, 1976, Ser. No. 692,761

Claims priority, application Germany, June 4, 1975, 7604334[U]

Int. Cl.[2] B65B *69/00*

U.S. Cl. 53—381 R **6 Claims**



1. A device for unpacking bottles or similar articles in a shrunk foil package, characterized by a table adapted to receive the shrunk foil package, with a stationary table top, a turntable and a lifting table which can be raised and lowered in relation to the table top and the turntable in order to form a receiving niche, a cutting device for cutting open the shrunk foil along the periphery of the package, a gripping device, which after the foil covering has been cut can be moved from the side to a position adjacent to the rim or edge of the box-shaped lower part of the shrunk foil produced by the cutting and on lifting the lifting table strips off the rim, and a frame adapted to surround the package, which holds the bottles together and can be displaced with the latter from the lower part of the shrunk foil.

4,050,224

MOWING IMPLEMENT

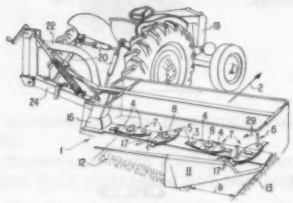
Pieter Adriaan Oosterling, and Hendricus Cornelis van Staveren, both of Nieuw-Vennep, Netherlands, assignors to Multinorm, B.V., Nieuw-Vennep, Netherlands

Filed July 21, 1975, Ser. No. 597,780

Claims priority, application Netherlands, July 22, 1974, 7409898

Int. Cl.[2] A01D *55/18*

U.S. Cl. 56—295 **16 Claims**



1. A mowing implement comprising, in combination:

an elongate housing adapted to be carried by a powered vehicle for movement over the ground surface with the housing extending transverse to the direction of movement effected by the powered vehicle;

gear means disposed within said housing and including at least one drive gear disposed along the length of the housing, said drive gear having a vertical shaft connected thereto and projecting upwardly through said housing, said gear means imparting rotation to said shaft;

horizontal pivot means attached to said shaft in closely overlying relation to said housing;

a pair of cutter supports pivotally engaged by said pivot means, said cutter supports projecting radially from said shaft and each carrying a cutter member which sweeps a circular path which extends forwardly of said housing, and each cutter support being freely pivotal on said pivot means about a horizontal axis whereby each cutter support is free to deflect upwardly out of the plane of said circular path and away from the top of said housing during operation of the mowing implement.

4,050,225

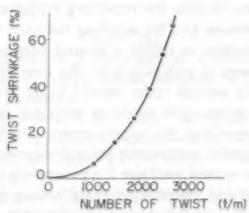
PROCESS AND APPARATUS FOR MEASURING FALSE TWIST IN THERMOPLASTIC SYNTHETIC YARN

Meiji Anahara, Kyoto, and Takayoshi Fujita, Takatsuki, both of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Feb. 21, 1975, Ser. No. 551,782

Int. Cl.[2] D01H *13/32*

U.S. Cl. 57—34 HS **13 Claims**



1. A process for false twisting a thermoplastic synthetic yarn wherein a yarn of thermoplastic synthetic fibers is fed through a feed roller, the fed yarn is false twisted by a false-twisting means while being heated and, then, the false twisted yarn is taken up through a delivery roller, which process comprises directly measuring, in a section within the twisting zone formed between the feed roller and the false-twisting means,

the speed of the yarn being processed under a normal operational condition with twisting to estimate the number of false twists actually imparted to the yarn by determining twist shrinkage of the yarn in said section from the measured yarn speed and the speed of the yarn being processed under the same condition as said normal operational condition but without twisting, which is measured in the same section as that wherein said speed of the yarn being processed under the normal operational condition with twisting has been measured and, then, estimating the number of twists from the determined twist shrinkage.

4,050,226

APPARATUS FOR TIMING A SPINNING-IN OPERATION OF A TEXTILE MACHINE

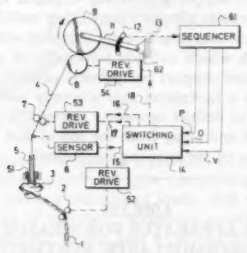
Marie Brozkova; Frantisek Burysek, both of Usti nad Orlici; Jan Janousek, Brandys nad Orlici; Karel Mikulecky, Chocen, and Stanislav Skoda, Usti nad Orlici, all of Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Oct. 7, 1976, Ser. No. 730,593

Claims priority, application Czechoslovakia, Oct. 7, 1975, 6777/75

Int. Cl.[2] D01H *15/00*

U.S. Cl. 57—34 R **6 Claims**



1. In a textile machine having a spinning chamber, first draw-off roller means for withdrawing spun yarn from the spinning chamber in a forward advance direction, the first roller means being reversible into a spinning-in mode in response to a first and a second reversing signal, a take-up bobbin, and second distributing roller means disposed in driving relation with the bobbin for receiving withdrawn yarn from the first roller means and for winding the yarn in roving fashion about the bobbin to define a wound yarn package whose diameter increases in proportion to the quantity of the withdrawn yarn, the second roller means being reversible into a corresponding spinning-in mode in response to a first and a second reversing signal, the improvement which comprises, in combination, means responsive to a progressive increase in diameter of the wound package for generating a succession of the first and second reversing signals having progressive delays corresponding to the increase in diameter, sensing means coupled to the machine for providing a first indication upon the occurrence of a yarn breakage condition, and switching means coupled to the output of the generating means and to the sensing means and rendered effective upon the occurrence of the first indication for individually applying the first and second reversing signals to the first and second roller means, respectively.

4,050,227

SPINDLE HAVING AN UNDERWIND CROWN FOR RING SPINNING AND RING TWISTING FRAMES, ESPECIALLY FOR CORD TWISTING FRAMES

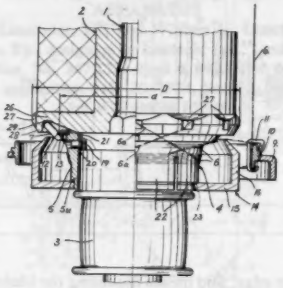
Wolfgang Berend, Durach, Germany, assignor to Saurer-Allma GmbH Allgauer Maschinenbau, Kempten, Germany

Filed Sept. 27, 1976, Ser. No. 726,917

Claims priority, application Germany, Oct. 6, 1975, 7531710[U]

Int. Cl.[2] D01H *11/00, 1/38*

U.S. Cl. 57—34.5 **14 Claims**



1. In a spindle for ring spinning and ring twisting frames for cord twisting frames having a bobbin, a whorl positioned beneath said bobbin, an underwind crown arranged coaxially on said spindle beneath said bobbin and above said whorl, said underwind crown having an extensively cylindrical sleeve part for the winding of a thread during underwind and an outwardly extending annular rim with recesses therein on the periphery thereof, and at least one knife having a cutting edge thereon projecting from the bases of said recesses comprising the improvement wherein around said cylindrical sleeve part of said underwind crown there is arranged an upwardly open thread catch box having an annular base which extends outwardly from the lower end of said sleeve part, the outer wall of said annular base extending to the height of the upper end of said sleeve part, an annular gap being defined between said outer wall and said annular rim on said sleeve part.

4,050,228

SLIVER SUPPLY APPARATUS FOR RESOLVING ROLLERS IN OPEN END SPINNING MACHINES

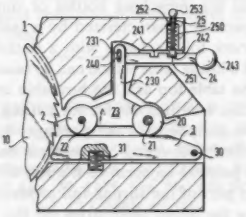
Hans Landwehrkamp, Lenting; W. Gerhard Hoeber, Ingolstadt-Oberhaunstadt; Georg Goldammer, Gaimersheim, and Rudolf Oexler, Ingolstadt, all of Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Germany

Filed Feb. 13, 1976, Ser. No. 658,081

Claims priority, application Germany, Feb. 13, 1975, 2506058

Int. Cl.[2] D01H *1/12*

U.S. Cl. 57—58.95 **25 Claims**



1. In a spinning machine having sliver-resolving apparatus

including a resolving roller, a first member and a second member cooperating with the first member to form a first sliver-feeding champing nip spaced from the resolving roller at an interval corresponding to the length of long fibers to be spun, one of such members being a driven roller for feeding sliver to the resolving roller, the improvement comprising a third member cooperating with the first member to form a second sliver-feeding champing nip spaced from the resolving roller at an interval corresponding to the length of short fibers to be spun, and selecting means for rendering said second clamping nip active or inactive on sliver being fed to the resolving roller.

18. In a spinning machine having sliver resolving apparatus including a resolving roller and means for supplying fiber sliver to the resolving roller, the improvement comprising the sliver supply means including a plurality of fiber feeding clamping nips located at different intervals from the resolving roller, which intervals correspond to lengths of fibers to be spun, and selecting means for rendering the nip closest to the resolving roller active or inactive on sliver being supplied by the sliver supply means to the resolving roller.

4,050,229

FRICTION TYPE YARN FALSE TWISTING APPARATUS

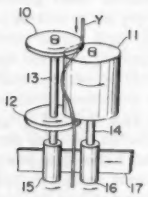
Nobuyuki Hayahusa, and Hiroaki Uno, both of Numazu, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed June 7, 1976, Ser. No. 693,329

Claims priority, application Japan, June 10, 1975, 50-70496; July 28, 1975, 50-91714

Int. Cl.[2] D02G *1/08*

U.S. Cl. 57—77.4 **7 Claims**



1. Friction type yarn false twisting apparatus consisting essentially of two parallel spaced apart rotary shafts, means for rotating said shafts in the same direction, at least two relatively thin spaced apart discs mounted on one of said shafts and a relatively thick disc on the other shaft located between said thin discs with axial spaces therebetween so as to slightly overlap with each other to form intersections between the peripheral portions of respective discs at angularly spaced points of the peripheral portions thereof whereby yarn is threaded successively through one of said intersections, diagonally across the peripheral surface of said thick disc and then through the other intersection thereby applying a flase twist to said yarn.

4,050,230

ROPE

Tadao Senoo, Gifu, and Kenji Honda, Gamagori, both of Japan, assignors to Ube Nitto Kasei Co., Ltd., Tokyo and Toyo Rope Manufacturing Co., Ltd., Gamagori, both of Japan

Filed Feb. 23, 1976, Ser. No. 660,406

Claims priority, application Japan, Feb. 24, 1975, 50-22651; Jan. 12, 1976, 51-1901[U]

Int. Cl.[2] D02G *3/04, 3/36*

U.S. Cl. 57—149 **5 Claims**

1. A rope comprising:

an inner core fiber bundle comprised of:

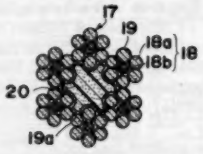
a plurality of first synthetic fibers,

a first thermosetting resin impregnating and connecting said first fibers, and

a first thermoplastic coating layer surrounding said first thermosetting resin impregnated fibers; and

a plurality of outer fiber bundles surrounding said core fiber bundles, each outer fiber bundle comprised of:

a plurality of second synthetic fibers,



a second thermosetting resin impregnating said second fibers, and

a second thermoplastic resin coating layer surrounding said second fibers impregnated with said thermosetting resin.

4,050,231

BICENTENNIAL EAGLE CLOCK

Aaron Lopez, and Juan Lopez, both of South Gate, Calif., assignors to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Oct. 4, 1976, Ser. No. 729,596

Int. Cl.[2] G04B *21/08, 37/00*

U.S. Cl. 58—13 **1 Claim**

1. A patriotic display clock assembly comprising a bell hung from a support member mounted on spaced pillars to a base, with a clock mounted on the wall of the bell, in which

a bell hammer is suspended inside the bell by a shaft to which it is fixed,

said shaft rotatably mounted at one end to the bell and fixed at the other end to the mechanism of the clock so as to cause the hammer to strike the bell wall when the shaft is oscillated by the clock mechanism.

4,050,232

CONSTRUCTION OF A FRAME OF A DIGITAL CLOCK

Jusuke Yaguinuma, Tokyo, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed June 2, 1976, Ser. No. 692,239

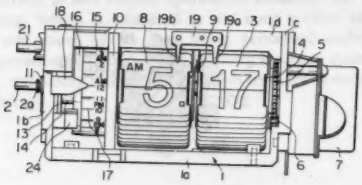
Claims priority, application Japan, June 5, 1975, 50-75299[U]

Int. Cl.[2] G04C *21/04;* G04B *29/02*

U.S. Cl. 58—52 R **3 Claims**

1. Construction of a frame of a digital clock having a pre-assembled assembly comprising of at least an indicating flap drum and a timer setting drum supported on a driving shaft and adapted to be mounted in said frame, said frame comprising: a frame member having opposite two side end plates integrally formed with a base plate of said frame member and a separate partition plate adapted to be detachably secured in position between said two side end plates, said assembly having a predetermined axial play between said indicating flap drum and said timer setting drum before said assembly is mounted in said

frame member for permitting said assembly to be mounted between said two side end plates by first inserting one of the opposite ends of said driving shaft through one of said side end plates and thereafter inserting the other end through the other



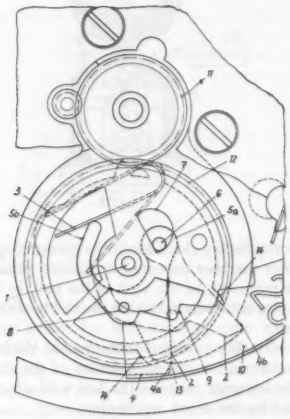
side end plate so as to be journaled thereby, said separate partition plate being attached in position to said frame member between said timer setting drum and said indicating flap drum for completing the assembling of said digital clock with said axial play being removed by said partition plate.

4,050,233

STEPPING MECHANISM FOR WATCHES

Kurt Murrle Ingenieur, Pforzheim, Germany, assignor to Pforzheimer Uhren-Rohwerke Rudolf Wehner, Pforzheim, Germany

Filed July 28, 1976, Ser. No. 709,399
Claims priority, application Germany, Sept. 27, 1975, 2543177
Int. Cl.² G04B *19/24*
U.S. Cl. 58—58 **13 Claims**



1. In a watch having a rotatably mounted date ring, the provision of a date-stepping mechanism for advancing said date ring, said mechanism comprising

a stationary peripheral first series of teeth,

a rotary drive element,

a date-stepping finger, which is mounted to be rotatable and radially displaceable relative to said rotary drive element into and out of engagement with said first series of teeth and comprises a stepping pin, a forked end portion having first and second prongs, and a drive pin carried by said first prong,

a one-way coupling element, which is in one-way coupling engagement with said drive pin and is eccentric with respect to and arranged to revolve with said rotary drive element in a predetermined direction of revolution and to repeatedly withdraw said date-stepping finger from said first series of teeth after respective intervals of time, and

spring means engaging said second prong and urging said date-stepping finger radially outwardly and in said predetermined direction of revolution,

said spring means being adapted to impart a rotary stepping movement to said date-stepping finger in said predetermined direction of revolution and into engagement with said first series of teeth when said date-stepping finger has thus been withdrawn from said first series of teeth,

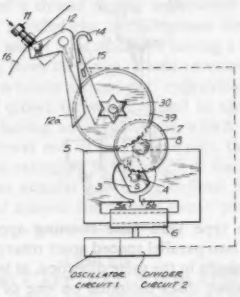
said mechanism also comprising a second series of teeth, which are carried by said date ring and arranged to be engaged by said stepping pin during said rotary stepping movement of said date-stepping finger.

4,050,234

ELECTRONIC TIMEPIECE HAND-RETURN MECHANISM

Mori Toshio, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Aug. 30, 1974, Ser. No. 502,133
Claims priority, application Japan, Aug. 30, 1973, 48-97748; Sept. 10, 1973, 48-101819
Int. Cl.² G04B *27/08*
U.S. Cl. 58—85.5 **15 Claims**



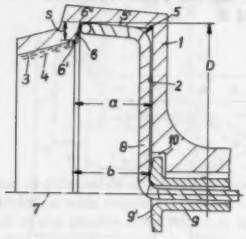
1. In a hand display electronic timepiece having a gear mechanically coupled to at least one of said hands, the rotational position of the gear determining the time indication position of said hand, an oscillator circuit for producing a high frequency time standard signal, divider circuit means for supplying an alternating polarity pulse signal of a predetermined low frequency in response to said high frequency time standard signal, said divider means being adapted to supply a pulse signal including first and second predetermined pulses in sequence immediately after resetting thereof, electro-mechanical converter means coupled to said divider circuit means to receive said pulse signal and including a rotor mechanically coupled to said gear to rotate said gear in response to said pulse signal, the improvement comprising manually operable resetting means mechanically coupled to said gear and electrically coupled to said divider means, said resetting means effecting a positioning of said gear and rotor to predetermined respective positions corresponding to $10n$ second positions of said hand, where $n = 1, 2, 3$, and resetting of said divider means so that the first pulse applied to said electro-mechanical converter means after release of said gear and rotor is adapted to retain said rotor at its predetermined position, the second pulse advancing said gear and said rotor.

4,050,235

SPINNING ROTOR FOR OPEN-END SPINNING UNIT

Rolf Neubert, Schwanewede, and Rolf Wehling, Bremen, both of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed June 28, 1976, Ser. No. 700,125
Claims priority, application Germany, June 28, 1975, 2528976
Int. Cl.[2] D01H *1/12*
U.S. Cl. 57—58.89 10 Claims



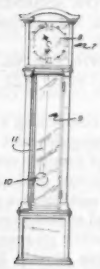
1. In a spinning rotor for an open-end spinning unit, the rotor defining a fiber collection trough and an intake portion whose cross section widens in the direction toward the fiber collecting trough, the intake portion being formed and disposed to provide a radially outwardly extending projecting portion presenting a surface which merges into and defines one boundary of the fiber collecting trough and which presents a region in which the rotor diameter is increased, the boundary of the fiber collecting trough opposite the projecting portion being defined by the spinning rotor bottom surface, the radially outermost end of the surface of the projecting portion defining the maximum diameter of the fiber collecting trough, and a portion of the trough between the outermost end of the projecting portion surface and the bottom surface, and adjacent the rotor bottom surface, presenting a region in which the diameter of the trough is less than such maximum diameter, the improvement wherein the axial distance between the projection of said rotor bottom surface and the radially innermost end of said projecting portion surface, measured at the level of the outermost end of said projecting portion surface, is between one-sixteenth and one-sixth of said maximum diameter of said fiber collecting trough.

4,050,236

CLOCK HAVING ORNAMENTAL PENDULUM WITH ADJUSTABLE PERIOD

Christian M. J. Jauch, Louisville, Miss., assignor to Spartus Corporation, Chicago, Ill.

Filed Apr. 8, 1976, Ser. No. 674,954
Int. Cl.[2] G04B *17/12*
U.S. Cl. 58—132 2 Claims



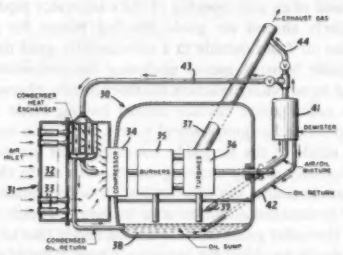
1. In a clock:
a shaft;
a pendulum having a bob;
means for oscillating said shaft to and fro about its axis and for controlling the speed of oscillation of said shaft, said controlling means being independent of said pendulum;
means, comprising bushing means fixed to said pendulum and having a loose friction fit on said shaft, mounting said pendulum on said shaft for free swinging movement of said pendulum in relation to said shaft;
said mounting means including means for imparting a driving force from said oscillating shaft to said pendulum, to provide continuous, uninterrupted swinging of the pendulum, when the shaft and pendulum oscillate in synchronism;
said loose friction fit between said bushing means and said shaft being the sole driving connection between said shaft and said bushing means and pendulum;
and adjusting means for adjusting the period of said free swinging pendulum, to synchronize said period with the oscillation of said shaft, without changing the distance between the axis of said shaft and the bob of said pendulum.

4,050,237

DEMISTER ASSEMBLY FOR REMOVING LIQUIDS FROM GASES

David B. Pall, Roslyn Estates, and Charles J. Rosch, Brooklyn, both of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Continuation of Ser. No. 450,032, March 11, 1974, abandoned.
This application Nov. 18, 1975, Ser. No. 633,062
Int. Cl.[2] F02C *7/06*; B01D *50/00*
U.S. Cl. 60—39.08 6 Claims



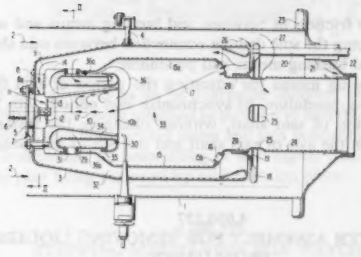
1. A gas turbine gas demister and recycle system capable of removing substantially all of the oil entrained as droplets in such gases, before the gases are vented to the atmosphere, comprising, in combination, a gas turbine engine including, in series flow connection, a gas compressor, a gas combustor and a gas turbine; and a lubricant storage supply for the engine in fluid flow connection therewith by gas and lubricant supply lines leading to the engine, and a return line leading from the engine, and a gas vent line in fluid flow connection with the lubricant storage supply for venting gas conveyed thereto by the return line; and a demister assembly in series in the gas vent line for coalescing and stripping gas-entrained liquid lubricant droplets from gas in this line, returning coalesced liquid lubricant to the lubricant storage supply, the demister assembly comprising, in combination, in series fluid flow, a primary coalescer composite folded in a corrugated configuration and comprising a nonwoven fibrous mat confined between rigid porous facing sheets to a density within the range from about 0.05 to about 0.5 g/cc, the fibers being sufficiently long so that they form a coherent nonwoven mat, and having a diameter within the range from about 0.25 to about 30 microns, and a secondary coalescer comprising a porous open-cell polyurethane foam sheet having a porosity within the range from about 50 to about 150 pores per square inch, and having an average density within the range from about 1 to about 3 lbs/cu ft.

4,050,238

FILM EVAPORATING COMBUSTION CHAMBER

Immanuel Holzapfel, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Mar. 15, 1976, Ser. No. 667,273
Claims priority, application Germany, Mar. 14, 1975, 2511172
Int. Cl.² F02C 7/22
U.S. Cl. 60—39.23 35 Claims



1. A film-evaporating combustion chamber, comprising an evaporator pipe means for evaporating a film of fuel distributed on an inner surface thereof, guide wheel means operable to produce a swirl of the combustion air and operatively connected ahead of an inlet opening of the evaporator pipe means, and tubularly shaped air guide housing means for guiding combustion air from outside in a substantially axial direction, the air guide housing means enclosing the evaporator pipe means and an adjoining reaction chamber means, characterized in that a radial guide cascade means having blade channel means is provided as guide wheel means, deflection means are arranged inside of the air guide housing means for supplying the substantially axially entering combustion air to the radial guide cascade means, the combustion air being deflected substantially in the axial direction after leaving the blade channel means of the radial guide cascade means, and in that an annular space means is provided for inducing a back flow of combustion air from the reaction chamber means to an area surrounding the evaporator pipe means, said annular space means is defined between an outer surface of the evaporator pipe means and an inner surface of wall means of the reaction chamber means which extend up to an inlet side of the blade channel means of the radial guide cascade means.

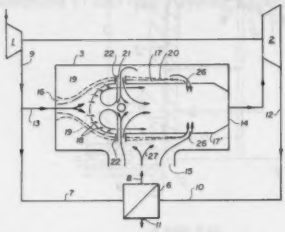
26. A film-evaporating combustion chamber, comprising an evaporator pipe means, guide wheel means operable to produce a swirl of the combustion air and operatively connected ahead of an inlet opening of the evaporator pipe means, and tubularly shaped air guide housing means for guiding combustion air from outside in a substantially axial direction, the air guide housing means enclosing the evaporator pipe means and an adjoining reaction chamber means, characterized in that a radial guide cascade means having blade channel means is provided as guide wheel means, deflection means are arranged inside of the air guide housing means for supplying the substantially axially entering combustion air to the radial guide cascade means, the combustion air being deflected substantially in the axial direction after leaving the blade channel means of the radial guide cascade means, and in that the deflection means is constructed as a hood means closed in a direction toward a side of an air inlet into the air guide housing means, the hood means surrounding the reaction chamber means with a spacing and being adjoined at an open end thereof by an axially displaceable throttle ring means.

4,050,239

THERMODYNAMIC PRIME MOVER WITH HEAT EXCHANGER

Guenter Keppler, Munich, and Adolf Fehler, Pfaffing, both of Germany, assignors to Motoren- und Turbinen-Union Munchen GmbH and M.A.N. Maybach Mercedes-Benz, both of Munich, Germany

Filed Sept. 8, 1975, Ser. No. 611,410
Claims priority, application Germany, Sept. 11, 1974, 2443363
Int. Cl.² F02C 7/10, 7/12
U.S. Cl. 60—39.51 R 8 Claims



1. A thermodynamic prime mover comprising a combustion chamber having cooling air inlet means and combustion air inlet means, an air compressor, and a heat exchanger, as well as a turbine, first conduit means operatively interconnecting said air compressor and said heat exchanger as well as said combustion chamber and said turbine, second conduit means branching off from said first conduit means upstream of said heat exchanger, a flame pipe located in said combustion chamber and having an upstream end facing said cooling air inlet means of said combustion chamber and a downstream end operatively connected to said turbine, said second conduit means being operatively connected to said cooling air inlet means of said combustion chamber, said second conduit means being dimensioned for directing about 3 to 10% of cool compressed air from said compressor toward and around at least the upstream end of said flame pipe whereby said 3 to 10% of compressed cool air forms a cooling jacket at least around the upstream end of said flame pipe without initially substantially participating in the combustion; said flame pipe further comprising substantially radially extending pipe sections adjacent the upstream end thereof and arranged for cooperation with said combustion air inlet means to receive preheated combustion air from said heat exchanger whereby the preheated combustion air enters the flame pipe through said pipe sections and thus through said cooling jacket, said pipe sections substantially separating said cool air of the cooling jacket from the preheated combustion air as the latter enters into said flame pipe.

4,050,240

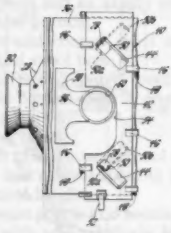
VARIABLE AIR ADMISSION DEVICE FOR A COMBUSTOR ASSEMBLY

John M. Vaught, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 26, 1976, Ser. No. 717,988
Int. Cl.² F02C 7/22
U.S. Cl. 60—39.65 2 Claims

1. A combustor assembly comprising a liner having an inlet and an outlet, a dome overlying the inlet and including means forming a passage for flow of primary combustion air into the liner, a fuel nozzle for directing fuel spray into a reaction mixing zone downstream of said dome, a plurality of slots with major and minor axes formed in said liner downstream of said dome, each of said slots having its major axis formed at an angle to the longitudinal axis of said liner, a control band rotatably supported on said liner in overlying relationship to said slots, a second plurality of slots in said band each having a major and minor axis, each of said second slots having its major axis intersecting the major axis of one of the first plural-

ity of slots, said band being rotatable to cause first and second slots to define a radially overlapped opening for flow of primary combustion air into the liner downstream of said dome, said radially overlapped opening being axially shiftable on said



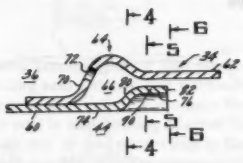
liner in response to rotation of said band to alter the location of primary air admission with respect to the fuel spray and to alter the axial extent of the mixing zone between the dome and the overlapped radial opening.

4,050,241

STABILIZING DIMPLE FOR COMBUSTION LINER COOLING SLOT

Thomas L. DuBell, Maineville, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 22, 1975, Ser. No. 642,727
Int. Cl.² F02C *7/18*
U.S. Cl. 60—39.66 **4 Claims**



1. In a combustor liner film cooling slot of the variety including an annular space extending circumferentially of the liner and defined between overlapping portions of telescoping liner segments, a cooling fluid plenum substantially circumscribing the liner, means for transferring cooling fluid from the plenum to the space, means for exhausting fluid from the space onto the liner, and an overhanging lip extending substantially axially downstream of the space for facilitating attachment of the fluid to the liner in a protective film barrier, the improvement comprising:

a stabilizing dimple disposed within said lip, the dimple including a substantially radially depressed portion, the depressed portion having a first radial height proximate its upstream extremity, a second radial height at its downstream extremity, said second radial height being greater than said first radial height, said depressed portion further including an intermediate segment intermediate said upstream and downstream extremities and having a radial height substantially equal to said second radial height.

4,050,242

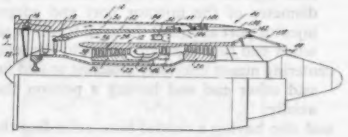
MULTIPLE BYPASS-DUCT TURBOFAN WITH ANNULAR FLOW PLUG NOZZLE AND METHOD OF OPERATING SAME

Donald J. Dusa, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 1, 1975, Ser. No. 636,442
Int. Cl.² F02C *3/06*; F02K *3/06*
U.S. Cl. 60—204 **8 Claims**

1. In a method of operating a propulsion nozzle for a gas turbine engine comprising a core engine, and two substantially coannular bypass flow ducts having a common wall therebetween, the steps of:

modulating the relative flow rates through the ducts with valve means disposed at the downstream end of the common wall; and



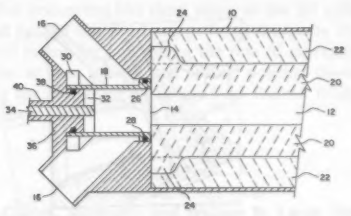
passing the sum of the duct flows through a variable area throat independent of the core engine and partially defined by an articulated plug and a cooperating circumscribing shroud.

4,050,243

COMBINATION SOLID FUEL RAMJET INJECTOR/PORT COVER

Allen L. Holzman, and William J. Corcoran, both of Palo Alto, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 17, 1976, Ser. No. 687,055
Int. Cl.² F02K *9/04*; F02B *27/02*
U.S. Cl. 60—245 **4 Claims**



1. An improved integral rocket-ramjet of a type in which a dual fuel system is burned in a combustion chamber having a nozzle at one end thereof, defined as the rear end, through which the gases of combustion are ejected to create thrust, one fuel of the dual fuel system containing sufficient oxygen to support combustion, the other fuel requiring air to support combustion, and having an injector port at the other end, defined as the forward end, of the combustion chamber and air inlet ports forward of said injector port and in communication with the outside atmosphere such that in flight, ram air enters the air inlet ports, wherein the improvement comprises;

a tube injector slidably mounted for axial movement in said injector port for translation from a first position during a boost phase when the fuel containing oxygen is combusting to a second position during a sustain phase when the fuel requiring air for combustion is combusting;

said tube injector comprising a substantially hollow cylinder having an annular nub at one end;

said annular nub having an outside diameter greater than said cylinder and essentially the same diameter as the inner diameter of said injector port;

an axially extending cylindrical step forwardly of said injector port and constituting a part of said rocket-ramjet;

the other end of said tube injector being supported interiorly on said axially extending cylindrical step;

the interior diameter of said tube injector conforming essentially to the exterior diameter of the step;

sealing means associated with said annular nub and said injector port;

other sealing means associated with said step and the interior circumference of said tube injector;

said sealing means and other sealing means in cooperation with said tube injector, step and injector port being operative to prevent outside air from entering the combustion chamber during the boost phase when said tube injector is in said first position;

stop means exteriorly mounted near the other end of said tube injector and having a dimension greater than the diameter of the injector port and adapted to abut the injector port and limit the axial travel of said tube injector when said tube injector moves to the second position;

centering means interiorly attached to said tube injector near said other end and having a portion thereof extending axially;

said step having a central bore extending therethrough;

said portion being carried and guided by said central bore in said step; and

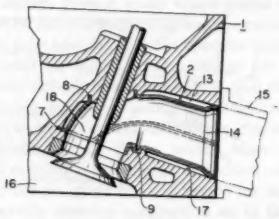
means for moving said tube injector from said first position to said second position during transition from said boost phase to said sustain phase.

4,050,244

CYLINDER HEAD

Nobutaka Morikawa, Aichi, and Susumu Tanaka, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 2, 1975, Ser. No. 637,015
Claims priority, application Japan, Sept. 17, 1975, 50-111773
Int. Cl.² F01N *7/08*
U.S. Cl. 60—282 **5 Claims**



1. A cylinder head having a cavity defined therein, one end of said cavity opening into a combustion chamber and the other end thereof opening into an exhaust pipe, a tubular port liner made of heat-resistant material positioned in said cavity with an annular space between the liner and the wall of the cavity, one end of said liner being adjacent said one end of said cavity and being rigidly secured to said cylinder head, the other end of said liner being adjacent the other end of the cavity and being flared to provide intimate contact between the liner and the wall of the cavity, said tubular port liner comprises upper and lower halves, each of which is semi-circular in cross-section, said upper and lower halves each having flanges of identical configuration extending outwardly from and along the edges thereof, and said flanges have portions at the other end of the liner which are wider than the other portions thereof.

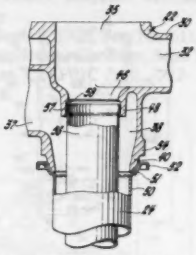
4,050,245

CONCENTRIC DUAL ENGINE EXHAUST SYSTEM

Harold A. Little, and Richard L. Balsley, both of Washington, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 11, 1976, Ser. No. 713,276
Int. Cl.² F01N *7/10*
U.S. Cl. 60—313 **6 Claims**

1. An exhaust manifold for a multi-cylinder internal combustion engine, said manifold defining two separate exhaust gas chambers, means for connecting said chambers to diverse ones of the engine cylinders to receive exhaust gas therefrom, an enlarged discharge passage extending from one of said chambers and terminating at a pipe fitting adapted to sealingly receive a first tubular exhaust pipe to carry exhaust gas from said one chamber, and a smaller discharge passage extending from the other of said chambers and terminating at a pipe



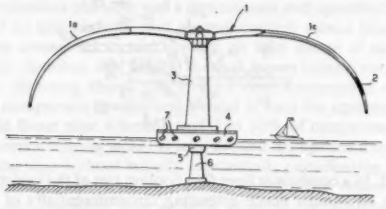
fitting disposed within the enlarged discharge passage and adapted to receive a second tubular exhaust pipe disposed within the first pipe to carry exhaust gas from said other chamber.

4,050,246

WIND DRIVEN POWER SYSTEM

Gaston Bourquardez, Vallon des Lauriers, Aix-en-Provence, France (13100)

Filed June 4, 1976, Ser. No. 692,823
Claims priority, application France, June 9, 1975, 75.17859
Int. Cl.² F03D *3/00*
U.S. Cl. 60—398 **18 Claims**



1. A wind driven power system having a rotor rotating about a vertical axis and power generating means operatively coupled to said rotor, said rotor having at least one blade, said blade being bowed in a vertical plane and torsionnaly soft along the full length thereof and provided with means for varying the pitch thereof according to a predetermined cyclic law of variation which has a frequency of pitch variation equal to the frequency of rotation of the rotor.

4,050,247

CONTROL VALVE FOR VARIABLE DISPLACEMENT PUMP OR MOTOR

Donald C. Connett, Huntington Beach, Calif., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 7, 1976, Ser. No. 730,558
Int. Cl.² F16H *39/46*
U.S. Cl. 60—444 **6 Claims**

1. A control valve for use with a hydraulic pump or motor having a swashplate movable from a neutral position to an actuated position to vary the displacement of said pump or motor in response to the porting of fluid from a relatively high pressure fluid source to one servo attached to the swashplate and the porting of fluid from another servo attached to the swashplate to a relatively low pressure fluid source, the control valve comprising:

a. a housing defining an axially extending spool bore;

b. a control spool located within said spool bore and having

a pair of axially spaced lands engaging said spool bore, a reduced center portion intermediate said lands and spaced from said spool bore, and a pair of reduced end portions axially outwardly from said lands and spaced from said spool bore, each of said lands having a given axial width defined by an axially outer edge adjacent said respective reduced end portion and an axially inner edge adjacent said reduced center portion;

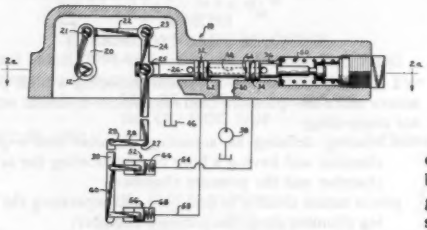
c. means to center said control spool relative to a given position within said spool bore;

d. linkage connected to said control spool and to said swashplate to move said control spool in response to movement of said swashplate;

e. a movable control handle;

f. linkage connected to said control spool and to said control handle to move said control spool in response to movement of said control handle;

g. a controlled pressure port in said housing adapted for fluid communication with said relatively high pressure fluid source and in fluid communication with said spool bore intermediate said lands when said control spool is centered;



h. means fluidly communicating said portion of said spool bore encircling said reduced end portions of said control spool with said relatively low pressure fluid source;

i. a first servo port in said housing adapted for fluid communication with one of said servos and in fluid communication with said spool bore at a position axially spaced in one direction from said controlled pressure port, said one servo port being partially covered by one of said lands when said control spool is centered;

j. a second servo port in said housing adapted for fluid communication with the outer of said servos and in fluid communication with said spool bore at a position axially spaced in the other direction from said controlled pressure port, said other servo port being partially covered by said other and when said control spool is centered; and

k. means providing fluid communication between said controlled pressure port and each of said servo ports, said fluid communication being provided via an orifice which has an area that is no greater than one-fourth of the area of the respective servo port which is not covered by the respective land when said control spool is centered.

4,050,248

CONTROL DEVICE FOR HYDROSTATIC DRIVE, ESPECIALLY FOR FORK LIFT TRUCK

Friedrich Hachmann, Dortmund, Germany, assignor to O & K Orenstein & Koppel Aktiengesellschaft, Dortmund, Germany

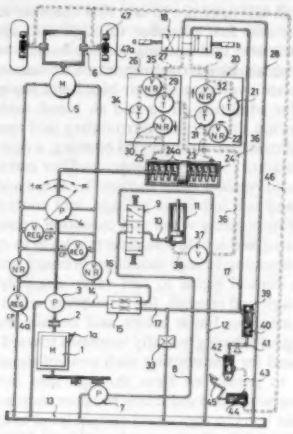
Filed Sept. 9, 1976, Ser. No. 721,758

Claims priority, application Germany, Sept. 17, 1975, 2541398

Int. Cl.[2] F16H *39/46*; F15B *11/16*

U.S. Cl. 60—445 **9 Claims**

1. In a control system for a fork lift truck having a fluid operable lift cylinder and a fluid drive motor and a variable delivery reversible pump connected to the motor and a drive engine connected to drive the pump; said pump having a control element movable from a first position of maximum pump delivery in forward direction through a position of zero pump delivery to a second position of maximum pump delivery in reverse direction, a fluid operable reversible actuator connected to said control element and normally biased toward a center position in which said control element is in zero delivery position, a second pump and a reversing valve having an inlet connected to said second pump and a respective output connected to each side of said actuator, a third pump and a



control valve connecting the third pump to the lift cylinder, both of said second and third pumps being driven by the engine, control means for controlling the rate of movement of said actuator at least toward said second position thereof in response to the supply of actuating fluid thereto from said reversing valve.

4,050,249

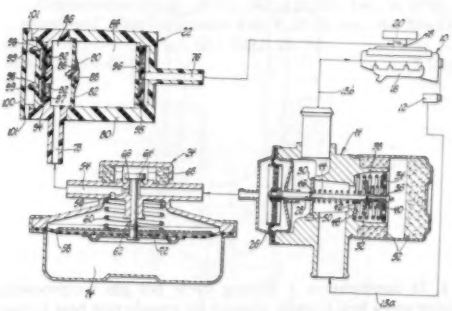
CONTROL UNIT

George R. Collins, Rochester, and William R. Large, Detroit, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 30, 1976, Ser. No. 681,785

Int. Cl.[2] F02B *75/10*

U.S. Cl. 60—290 **2 Claims**



1. A control unit for use on an internal combustion engine having an induction passage for combustion air flow to the engine, a throttle in said induction passage for controlling air flow therethrough, an exhaust passage for exhaust gas flow from the engine, a conduit for air flow to said exhaust passage to support oxidation of exhaust gases therein, and a pressure responsive valve assembly for controlling air flow through said conduit and adapted to permit air flow through said conduit in response to a control signal below a certain level and to divert

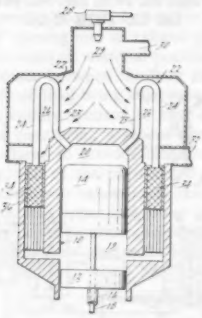
air flow from said conduit in response to a control signal above said certain level, said control unit comprising a housing, a partition secured in said housing and defining a first chamber for sensing the induction pressure in said induction passage downstream of said throttle and a second chamber for creating a control signal and transmitting such control signal to said valve assembly, said partition having at least one aperture, an umbrella check valve permitting flow from said second chamber through said aperture to said first chamber and obstructing flow from said first chamber through said aperture to said second chamber, said housing further having at least one sintered metal air bleed opening into said second chamber, a retainer plate overlying said air bleed and having at least one opening for admitting air to said air bleed, said retainer plate further having a projection surrounding said opening to inhibit passage of moisture through said opening, a dust cover overlying said retainer plate, and composite filter cartridges disposed between said retainer plate and said air bleed and between said aperture and said induction passage, said control unit defining means for responding when said induction pressure is constant or decreasing and is below said certain level to create a control signal conforming to said induction pressure and for transmitting such control signal to said valve assembly to permit air flow through said conduit, for responding when said induction pressure increases but is below said certain level to create a control signal which gradually increases toward said induction pressure and for transmitting such control signal to said valve assembly to permit air flow through said conduit, and for responding when said induction pressure increases from below said certain level to above said certain level to create a control signal which gradually increases to above said certain level and for transmitting such control signal to said valve assembly to divert air flow from said conduit upon elapse of an interval following said increase in said induction pressure to above said certain level.

4,050,250

HEAT TRANSFER ELEMENT

Louis J. Danis, Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 30, 1975, Ser. No. 627,423
Int. Cl.² F02G *1/04*
U.S. Cl. 60—517 **10 Claims**



1. In combination, a Stirling cycle hot gas reciprocating engine and a heat transfer element for transferring heat formed by the combusting fuel to the pressurized contained working gas comprising:

an enclosure having an outer surface exposed to the hot gases caused by said combustion and defining an internal cavity;

a relatively gas impermeable, high strength container located within the cavity to hold the pressurized working gas to be heated; and

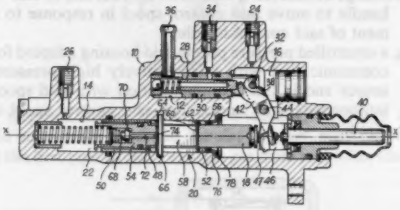
a low melting temperature metal disposed in the chamber defined between the inner surface of the enclosure and the outer surface of the container, the metal being a liquid at the operating temperature of the heat transfer element.

4,050,251

HYDRAULIC BOOSTER

Jean-Jacques Carre, Montreuil, and Roland Muterel, Bessancourt, both of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed Jan. 26, 1976, Ser. No. 652,265
Claims priority, application France, Mar. 4, 1975, 75.06652
Int. Cl.² B60T *13/16*; F15B *7/00*
U.S. Cl. 60—550 **8 Claims**



1. In a hydraulic power system including a high pressure source and a low pressure fluid reservoir, a hydrauic servomotor comprising:

a housing defining an actuating chamber and a pressure chamber and having a bore communicating the actuating chamber and the pressure chamber;

piston means slidable in said bore and separating the actuating chamber from the pressure chamber;

said piston means including an outer piston and an inner piston disposed within the outer piston;

a distributing valve communicating with the high pressure source and the low pressure fluid reservoir to control the pressure in the actuating chamber;

operator actuating means cooperating with said distributing valve to communicate the actuating chamber with the high pressure source;

said piston means being responsive to the pressure in the actuating chamber to move in the bore and effect pressurization of said pressure chamber;

releasable coupling means between the inner piston and the outer piston to permit the inner and the outer pistons to move in unison when the pressure in the actuating chamber is above a predetermind value and to disengage the inner piston from the outer piston when the pressure in the actuating chamber is below the predetermined value and said operator actuating means is engageable with the inner piston to move the inner piston relative to the outer piston;

abutment means attached to said housing;

said inner and outer pistons having openings to receive said abutment means to limit the movement of the inner and outer pistons in the bore when said abutment means engages the inner and the outer pistons.

4,050,252

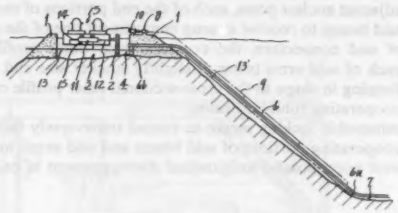
OCEAN NUCLEAR POWER EQUIPMENT

Tetsuichiro Nakanishi, Osaka, Japan, assignor to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan

Filed Jan. 23, 1976, Ser. No. 651,892
Int. Cl.² F01K *23/04*; F03G *7/04*
U.S. Cl. 60—641 **11 Claims**

1. Ocean nuclear power equipment comprising a nuclear reactor power plant, a reservoir for storage of hot discharge water from cooling the nuclear reactor, the water pooled in said reservoir being circulatorily used as nuclear reactor cooling water, a source of cold water, a temperature differential power plant including electric generating means which makes

use of a temperature differential between said hot discharge water and steam obtained from the nuclear reactor, and said cold water, means for conducting said hot discharge water through the temperature differential power plant to the reservoir whereby the temperature of said discharge water is lowered for recirculation to the nuclear reactor as said cooling water, and means for discharging said cold water from the temperature differential power plant.



4,050,253

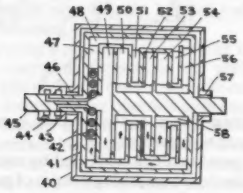
THERMODYNAMIC MACHINE

Michael Eskeli, 7994-41 Locke Lane, Houston, Tex. 77042

Continuation-in-part of Ser. No. 674,398, April 7, 1976. This application May 13, 1976, Ser. No. 685,998

Int. Cl.[2] F02C *1/04*

U.S. Cl. 60—650 **6 Claims**



4. In a power generator wherein within a rotating rotor a compressible working fluid is compressed and then expanded, the improvement comprising:

a. compressing said working fluid adiabatically by centrifugal force in an outwardly extending fluid passage within said rotor;

b. removing heat from said working fluid downstream of said compression in a heat exchanger carried by said rotor;

c. expanding said working fluid in an inwardly extending fluid passage with heat being added into said working fluid during the expansion by a heat exchanger being carried by said rotor.

4,050,254

MODULAR STRUCTURES, RETAINING WALL SYSTEM, AND METHOD OF CONSTRUCTION

Homayoun J. Meheen, Golden, and Farrel D. Nielson, Castle Rock, both of Colo., assignors to International Engineering Company, Inc., Denver, Colo., by said Farrel D. Nielson

Filed Aug. 13, 1975, Ser. No. 604,437

Int. Cl.[2] E02D *5/00*

U.S. Cl. 61—39 **13 Claims**

1. A tie-back element, for modular assembly of a wall for retaining soil along an embankment, such element to be used in combination with and in spaced relationship from other similar elements, with soil retaining panel means extending between each pair of such elements, comprising

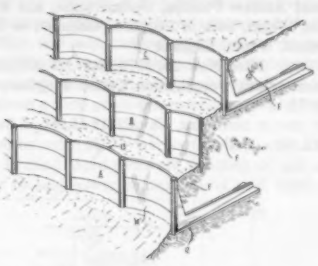
an elongated, rigid, vertically oriented column means having upper and lower longitudinal ends,

an elongated, rigid, horizontally extending leg means projecting in angled relationship to such column means from the lower longitudinal end of such column means, such leg means including horizontally oriented flange means, and

web means extending between the column means and the leg means within the interior angle formed by such column means and leg means,

such column means, leg means, and web means being unitary and sharing a common vertical plane when the element is in normal upright position for use in a retaining wall,

such column means including means extending along a major portion of its length for receiving an end of a soil retaining panel means,



such elongated leg means having an overall length which is greater than the height of such column means and including a terminal end longitudinally spaced from that end of the leg means contiguous to the column means, with cross-sectional dimensional characteristics of such leg means being greater at locations contiguous to the terminal end than corresponding dimensional characteristics of portions of such leg means contiguous to such column means,

such web means extending along the leg means toward such terminal end.

4,050,255

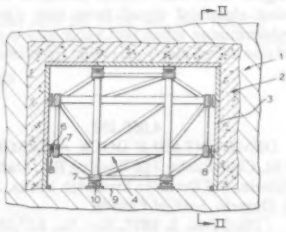
METHODS OF SHIFTING HEAVY AND/OR LOADED STRUCTURES

Nils Harald Ahlgren, 22 Skyttevagen, 133 00 Saltsjobaden, Sweden

Continuation-in-part of Ser. No. 478,592, Dec. 6, 1974, abandoned. This application July 9, 1975, Ser. No. 594,516

Int. Cl.[2] E21D *11/10*

U.S. Cl. 61—45 C **5 Claims**



1. A method for shifting a heavy supporting structure used with a load carrying structure which remains stationary relative to shifting movements of said heavy supporting structure, a plurality of jack rods being carried by said load carrying structure and being secured against relative motion with respect thereto, said heavy supporting structure supporting said load carrying structure in a manner such that said heavy supporting structure is slideable relative to said load carrying

structure, a plurality of climbing jacks being secured to said heavy supporting structure, said climbing jacks being adapted to operatively engage said jack rods; said method comprising simultaneously operating said plurality of climbing jacks so that said climbing jacks move along said jack rods thereby sliding said heavy supporting structure relative to said load carrying structure which remains stationary, the reactive force in said jack rods caused by the operation of said climbing jacks being transferred to said load carrying structure by said jack rods.

4,050,256

MINE ROOF SUPPORT CONTROL SYSTEMS

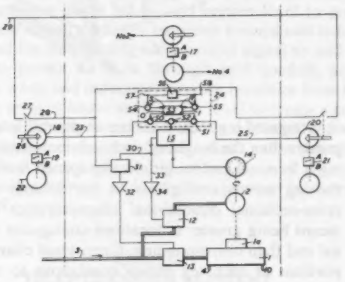
Reginald Andrew Phillips, Skelmersdale, and Kenneth Darbyshire, Wigan, both of England, assignors to Gullick Dobson Limited, Wigan, England

Filed Nov. 25, 1975, Ser. No. 635,148

Claims priority, application United Kingdom, July 29, 1975, 31625/75

Int. Cl.[2] E21D *15/44*

U.S. Cl. 61—45 D **16 Claims**



1. A control system for at least one self-advancing mine roof support comprising: remote selection means for providing a plurality of different coded electrical signals each of which represents a different desired function of said support, means interconnecting said remote selection means with apparatus at said support, said apparatus comprising function selection pressure fluid valve means responsive to at least one of said coded electrical signals for selecting a desired function of said support, signal generating means coupled to said valve means for generating a similar coded electrical signal which represents the instantaneous function state of said valve means, and comparator means connected to receive said at least one coded electrical signal from said remote selection means and said similar coded electrical signal from said signal generating means for determining when said valve means corresponds to said at least one coded electrical signal from said remote selection means.

4,050,257

DEMOUNTABLE DOCK ASSEMBLY

Blanchard St. Clair Parks, 311 Bunting Rd., Unit 22, St. Catharines, Ontario, and Bernette Frederick Parks, 35 Whyte Ave., Thorold, Ontario, both of Canada

Filed Dec. 3, 1975, Ser. No. 637,458

Int. Cl.[2] E02B *3/20*; E04B *1/00*

U.S. Cl. 61—48 **13 Claims**

1. A demountable dock assembly for use beside and in a body of water comprising:

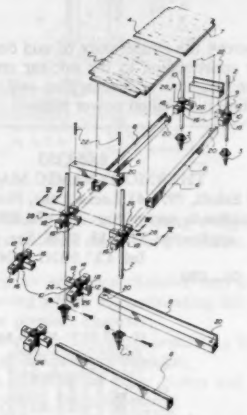
a. a plurality of anchor posts, the lower ends of each of which having associated therewith means for imbedding said post in a solid base;

b. a connector slidable along and about each of said anchor posts, said connector having at least two arms extending outwardly from a central portion of said connector, said arms lying at an angle to the direction of the longitudinal axis of the post when positioned thereabout;

c. means associated with each said connector to secure said connector at a predetermined position on said anchor post;

d. at least one open-ended tubular beam to extend between adjacent anchor posts, each of the end portions of each of said beams to receive in snug engagement one of the arms of said connectors, the cross-sectional outer profile of each of said arms being of slightly smaller size and conforming in shape to the cross-sectional inner profile of the cooperating tublular beams;

e. removable locking means to extend transversely through cooperating portions of said beams and said arms, to prevent unpurposeful longitudinal disengagement of each of said cooperating beams and connector arms from their position in snug engagement;



f. one or more panel sections supported by said beams each of said panel sections comprising a series of parallel spaced planks of common lengths and thicknesses, a U-shaped brace extending on opposite sides of the panel section embracing the ends of the planks to secure them in spaced relation;

g. said beams having associated therewith securing means comprising a longitudinal flange integral with and extending in the same plane as an exterior surface of said beams supporting outer edges of said panel sections, said plank braces seated on said beams and adjacent said flanges;

e. portions of said panel sections when in position supported by said beams lie above said removable locking means.

4,050,258

METHOD OF BUILDING EMBANKMENTS AND STRUCTURE SUPPORTS OF BACKFILLING

William E. Brewer, Toledo, Ohio, and Franklin V. Zimmer, Southfield, Mich., assignors to K-Krete, Inc., Toledo, Ohio

Division of Ser. No. 475,579, June 3, 1974. This application Dec. 3, 1975, Ser. No. 637,276

Int. Cl.[2] E02D *17/12*; C04B *13/22*

U.S. Cl. 61—50 **12 Claims**

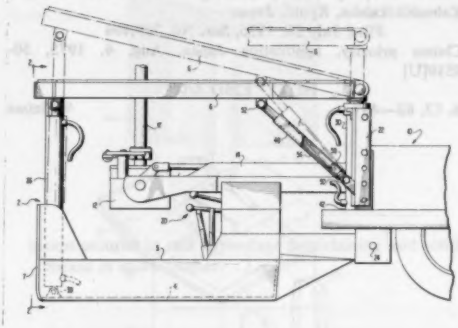
1. A method of building an embankment, comprising defining the area to be filled and introducing a controlled density fill material into the area, such controlled density fill material consisting essentially of 2% to 6% by weight of Portland cement, 2% to 10% by weight of fly ash, 70% to 90% by weight of aggregate, and 5% to 15% by weight of water, the fill material being sufficiently placeable and flowable that tamping or vibrating is unnecessary and having a concrete-comparison 28-day compressive strength of less than 1400 psi, whereby the material may be easily re-excavated.

4,050,259

SAFETY SHIELD AND TEMPORARY ROOF SUPPORT

Ray Childress, P.O. Box 86, Richlands, Va. 24641

Filed Sept. 22, 1976, Ser. No. 725,648
Int. Cl.[2] E21C *11/02*
U.S. Cl. 61—63 6 Claims



1. A safety shield and temporary mine roof support comprising

a mounting assembly for attachment to a machine to be controlled,

a platform having inboard and outboard ends said platform having thereon between the ends thereof a control station for said machine and providing a support adjacent said control station for a machine operator,

means pivotally mounting the inboard end of said platform to said mounting assembly,

a canopy having a part thereof overlying the control station and the operator's support on the platform and having inboard and outboard ends, extensible-retractable hydraulic jacks means having opposite ends respectively pivoted to the outboard ends of the platform and canopy,

extensible-retractable hydraulic jack means having one end pivoted to the inboard end of the canopy and means supporting the other end from said mounting assembly,

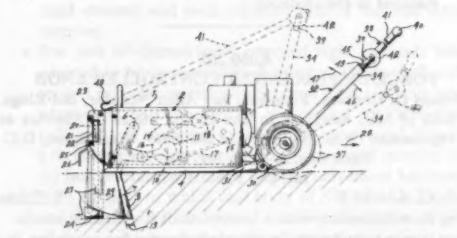
and means for supplying pressure and return fluid to and from said hydraulic jack means.

4,050,260

UNDERGROUND CABLE LAYING MACHINE

Denis Lemay, R. R. No. 1, Bromptonville, Canada

Filed July 6, 1976, Ser. No. 702,478
Int. Cl.[2] A01B *3/64, 11/00*; F16L *1/00*
U.S. Cl. 61—72.6 5 Claims



1. An underground cable laying machine comprising a body operatively defining a forward longitudinal direction, runners fixed under said body, extending lengthwise in said longitudinal direction and operatively supporting the whole cable laying machine on the ground, a cutter having an elongated cutting edge downwardly extending endwise below the runners, a cable guide including a pair of cable guide wings downwardly extending edgewise substantially co-extensive with said forward longitudinal direction and laterally guiding a cable in downwardly extending position rearward of said cutting edge, pivot means pivotally supporting said cutter on said body for pivotal movement of the cutter about a transverse axis relative to said body and to said longitudinal direction, reciprocation drive assembly mounted on said body, connected to said pivoted cutter, and reciprocatively pivoting the latter to and fro in said longitudinal direction, an elongated handle including a lower section and an upper section, ground-engaging wheels rotatably connected to said lower section and defining a wheel rotation axis extending transversely of said body, said lower section being pivoted to the assembly of said runners and body about a second pivot axis extending transversely of said runners and body at the opposite end of the latter relative to said cutter, a first abutment means operatively interposed between said lower section and said runners and limiting downward pivoting of said lower section relative to said runners and body, said upper section being pivoted to the upper end of said lower section about a third pivot axis extending transversely of said runners and body, and a second abutment means operatively interposed between said lower section and upper section and adjustably limiting the downward pivoting of said upper section relative to said lower section about said third pivot axis.

4,050,261

METHOD OF BACKFILLING

William E. Brewer, Toledo, Ohio, and Franklin V. Zimmer, Southfield, Mich., assignors to K-Krete, Inc., Toledo, Ohio

Filed June 3, 1974, Ser. No. 475,579
Int. Cl.[2] F16L *1/00*; C04B *7/02, 7/12*
U.S. Cl. 61—105 5 Claims

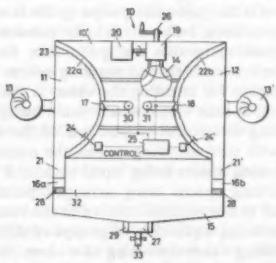
1. A method of backfilling a conduit wherein the conduit is installed in a trench, the method comprising installing the conduit, placing controlled density fill material over the conduit without compacting such fill material, such controlled density fill material consisting essentially of 2% to 6% be weight of Portland cement, 2 to 10% by weight of flyash, 70 to 90% be weight of aggregate and 5 to 15 % by weight of water, the fill material being sufficiently placeable and flowable that tamping or vibrating is unnecessary and having a concrete comparison 28-day compressive strength of less than 1400 psi, whereby the material may be easily re-excavated.

4,050,262

APPARATUS FOR EXTRACTING WATER FROM THE ATMOSPHERE

Walter Mehnert, Ottobrunn, Germany, assignor to Firma "Technico Development and Financing S. A.", Fribourg, Switzerland

Filed July 26, 1976, Ser. No. 708,875
Claims priority, application Germany, Aug. 9, 1975, 2535668
Int. Cl.[2] F25D *17/06*
U.S. Cl. 62—160 10 Claims



1. An apparatus for extracting water from the atmosphere,

comprising a heat pump including a compressor, drive means operatively connected to said compressor of the heat pump, chamber means including inlet ports, valve means connecting said chamber means to said heat pump at the heat withdrawing low pressure side thereof, suction means connected to said chamber means for transporting air therethrough, and means connected to said chamber means for withdrawing water from said chamber means, and wherein said chamber means comprise two separate chambers, said valve means comprising a multi-way valve connecting both chambers alternately to said heat pump in such a manner that heat is supplied to one chamber when heat is withdrawn from the other chamber and vice versa, said apparatus further comprising control means, sensing means responsive to an operating condition in said chambers, said sensing means being operatively connected to said control means, said valve means being operatively connected to said control means whereby the operation of said valve means depends on the operating conditions in said chambers.

4,050,263

ARRANGEMENT FOR CONTROLLING THE OPERATION OF A COOLING SYSTEM IN AN AUTOMOTIVE VEHICLE

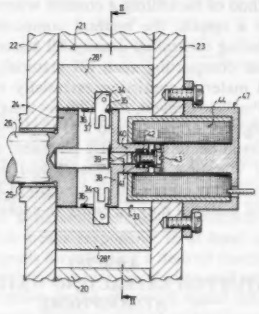
Gerhard Adalbert, Campinas, Brazil; Jürgen Hess, Baden-Baden, and Ulrich Hecht, Buhlertal, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Division of Ser. No. 650,762, Jan. 20, 1976. This application July 26, 1976, Ser. No. 709,167

Claims priority, application Germany, Jan. 21, 1975, 2502184

Int. Cl.[2] B60H *3/04*; F25B *27/00*; B63H *1/20*; F04B *49/00*

U.S. Cl. 62—243 **14 Claims**



1. A cooling-medium compressor, comprising, in combination, a stator housing having a housing chamber defined by an interior wall; a rotor mounted for rotation in the housing chamber, the outer surface of the rotor and the interior wall of the housing together defining between themselves crescent-shaped working spaces, the rotor having a plurality of generally radially oriented guide slits, the rotor further including sliding vanes in the guide slits guided by the latter for generally radial reciprocation between radially extended and radially retracted positions within the guide slits, the sliding vanes dividing the crescents-shaped working spaces into individual cells; and means for arresting the vanes in the retracted positions thereof, at least some of said vanes being provided with such arresting means, but at least one of the vanes not being provided with such arresting means, the number of crescent-shaped working spaces being equal to *n*, and the *n* crescent-shaped working spaces being arranged point-symmetrically with respect to one another relative to the rotation axis of the rotor, there being a plurality of groups of sliding vanes, each group of sliding vanes consisting of *n* vanes likewise arranged point-symmetrically with respect to one another relative to the rotation axis of the rotor, all the vanes of at least one group being provided with such arresting means, and all the vanes of at least one group not being provided with such arresting means.

4,050,264

REFRIGERATING CONTAINER

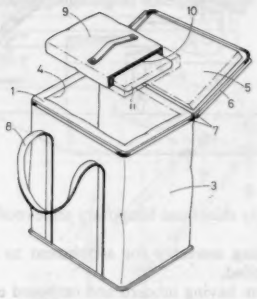
Mikio Tanaka, Kyoto, Japan, assignor to Makoto Takugyo Kabushikikaisha, Kyoto, Japan

Filed July 28, 1976, Ser. No. 709,404

Claims priority, application Japan, Aug. 4, 1975, 50-108510[U]

Int. Cl.[2] F25D *3/08*

U.S. Cl. 62—457 **9 Claims**



1. A portable refrigerating container comprising, in combination:

a bag member having outwardly facing side walls;

carrying straps fixed to said side walls;

an inner box removably positioned within said bag member, said inner box having an opening at one end thereof and inwardly facing inner side wall means defining a storage chamber having a given horizontal cross-sectional configuration along at least a substantially portion of its height;

a covering lid pivotally fastened to said bag member along a top, side edge thereof;

a lid member fixed to said covering lid for closing said opening at one end of said inner box when said covering lid is in its closed position; and

an inner lid slidably and closely engaged with said inner side wall means, said inner lid having a recess therein for holding cooling material;

whereby material to be refrigerated may be stored in the storage chamber to variable levels and the inner lid with the cooling material therein can be slid downwardly within the chamber and be positioned in contact with the material in the chamber.

4,050,265

FORCE-DISPLACEMENT CONTROLLER KNOB

Thomas G. Drennen, Ferguson, and Allen Neander, Bel-Ridge, both of Mo., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 3, 1976, Ser. No. 711,192

Int. Cl.[2] F16D *3/64*

U.S. Cl. 64—11 R **6 Claims**

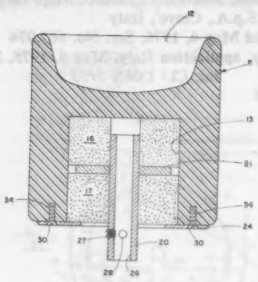
1. In combination with a control shaft for force controls:

an appendage having a chamber therein for receiving the free end of said shaft;

bifurcated compressible resilient means in said chamber for providing a selected resistance to force applied to said appendage;

rigid means secured to said shaft end and axially and laterally engaging said resilient means for transmitting selectively lesser force to said shaft than is applied to said appendage, said rigid means and said resilient means in part spaced

from said appendage so as to permit selected movement of said rigid means in said chamber; and



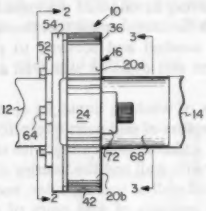
means secured to said appendage for retaining said resilient means in said chamber.

4,050,266

DRIVE COUPLING

Lawrence A. Bergman, Euclid, Ohio, assignor to Lord Corporation, Erie, Pa.

Filed Nov. 21, 1975, Ser. No. 634,204
Int. Cl.[2] P16D *3/64*
U.S. Cl. 64—14 **15 Claims**



1. A drive coupling adapted to connect first and second rotatable shafts comprising:

a. a rigid member that has four coplanar radially extending arms, adjacent arms being oriented perpendicular to each other;

b. a rigid element disposed between each arm of the four-armed member and the arms perpendicular to said arm; and

c. a body of elastomer disposed between and secured to each rigid element and each adjacent arm of the four-armed member,

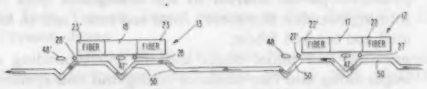
a first pair of diametrically opposed rigid elements being adapted to be connected to the first rotatable shaft and a second pair of diametrically opposed rigid elements being adapted to be connected to the second rotatable shaft, each body of elastomer being (i) precompressed between a rigid element and an arm of the four-armed member and (ii) less resistant to relative parallel movement between a rigid element to which said body of elastomer is secured and an arm of the four-armed member to which said body of elastomer is secured resulting from rotation of said rigid element relative to said arm of the four-armed member about a point disposed between said rigid element and a diametrically opposed rigid element than to relative movement of said rigid element toward said arm of the four-armed member resulting from rotation of said rigid element relative to said arm of the four-armed member about an axis that passes through said rigid element and through said diametrically opposed rigid element.

4,050,267

SLIVER HIGH PILE FABRIC KNITTING MACHINE

Rudolph S. Schaab, Rte. 2, Lakeview Road, Caryville, Tenn. 37714, and John C. Harralson, 7501 S. Whispering Oak, Powell, Tenn. 37849

Filed Mar. 25, 1976, Ser. No. 670,400
Int. Cl.[2] D04B *9/12*
U.S. Cl. 66—9 B **9 Claims**



1. In a sliver high pile fabric knitting machine having a rotatable circle of independent needles and a plurality of sliver and yarn feeding stations spaced circumferentially around the needle circle, the improvement comprising means for knitting a plurality of pile fiber-retaining fabric courses at one or more of said stations, said means including, at a single station,

a. a sliver feeding device for delivering a plurality of separate laterally spaced individual rovings of sliver fibers to separate arcuately spaced fixed locations of the needle circle;

b. a separate yarn feeding tube associated with each roving and disposed adjacent each said spaced location of the needle circle for delivering yarn to the needles; and

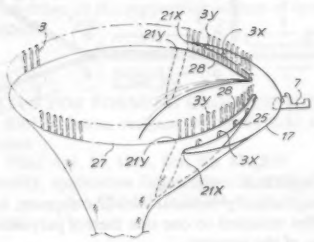
c. a separate set of knitting cams disposed adjacent each said spaced location of the needle circle for actuating the needles to receive sliver fibers and yarn and form said fibers and yarn into a course of pile fiber-retaining fabric.

4,050,268

PROCESS FOR FORMING PANTY HOSE AND AN ARTICLE FORMED THEREBY

Jo Clara Boyer, Los Angeles, Calif., assignor to Saviano, A.G., Balzers, Liechtenstein

Filed Feb. 9, 1976, Ser. No. 656,739
Claims priority, application Germany, Feb. 10, 1975, 2505536
Int. Cl.[2] D04B *9/00*
U.S. Cl. 66—19 **5 Claims**



1. Process for forming a panty-hose type article with a continuous rotational motion of the needle cylinder, in a circular knitting machine which is provided with retaining means - such as sinkers with a rear recess - to support the knit fabric along the working area of the needles of the cylinder, in such a manner as to receive and retain said knit fabric from the needles and subsequently return it to the needles, said process including:

forming a first leg portion of tubular knit fabric by knitting with all the needles;

engaging a portion of the knit fabric working front on said retaining means along a first arc of needles corresponding to the crotch and retaining said knit fabric thereon, with the needles being free to knit fabric separator from the portion on said retaining means;

starting two initial edges of two disc - like areas along two

semiarcs wherein said first arc is divided by a central origin and retaining said initial edges;

forming the body portion by continuing knitting along the arc supplementary to said first arc and through pocket portions formed between said initial retained edges and the active needles of said both semiarcs, by cyclically activating and deactivating along each semiarc variable needle arcs starting from said origin, and by anchoring the produced partial courses to the contiguous ones thus forming two disc-like areas - front and rear - and an arcuated and tapered fabric;

connecting said initial edges and the corresponding end edges along said two semiarcs contiguous and symmetrical, to the origin, and forming a final lip for unthreading and clearing the needles of said two semiarcs;

resuming by the needles of said first arc the knitting along the line retained by said retaining means; and

starting a second tubular leg portion knit along said first arc of the crotch formed by said two contiguous semiarcs and by the origin included therebetween, said second tubular knit portion being partly formed as a continuation of the working front of the needles of the arc supplemental to said first arc of the crotch.

4,050,269

DRY THERMAL TRANSFER OF ORGANIC COMPOUNDS BY NEEDLE-BEARING SUPPORT

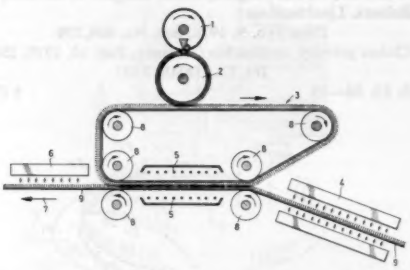
Fritz Mayer, Haltingen, Germany, assignor to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 571,651, April 25, 1975, Pat. No. 3,986,823. This application Apr. 27, 1976, Ser. No. 680,641

Claims priority, application Switzerland, Apr. 29, 1974, 5875/74

Int. Cl.² D06B *1/10*; D06P *5/15*

U.S. Cl. 68—5 D **1 Claim**



1. An apparatus comprising:

a. a longitudinally-movable web-like support, having metal needles mounted on one side thereof perpendicular to the plane of the support;

b. means for applying a heat-transferable organic compound to the needles of the support;

c. means for feeding a textile web into superposed contact with the needles of the support;

d. means for moving the textile web and the needle-bearing support in contact therewith, longitudinally, to pass both through a needle-heating zone and pass the textile web thought a warming zone;

e. means for heating the needles at a temperature high enough to cause the heat transference of the organic compound from the needles to the textile web;

f. means for separating the textile web, bearing the heat-transferred organic compound, from the needle-bearing support; and

g. means for warming the textile web at a temperature high enough to fix the heat-transferred organic compound to the textile web.

4,050,270

APPARATUS FOR WASHING AND SCOURING FABRICS

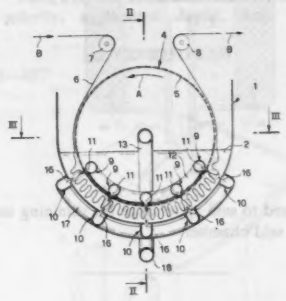
Gino Dalla Vecchia, Santorso (Vicenza), Italy, assignor to Sperotto Brevetti S.p.A., Carre', Italy

Filed May 4, 1976, Ser. No. 682,974

Claims priority, application Italy, May 5, 1975, 23008/75

Int. Cl.² D06B *3/28*

U.S. Cl. 68—158 **2 Claims**



1. Apparatus for washing and scouring fabric comprising

a tub containing washing liquid and having a wall with at least one opening therethrough,

a cylinder mounted for rotation in said tub and having a perforated side wall forming a driving element for the fabric to be washed and scoured,

said cylinder having its said side wall spaced from the interior of said tub forming a space therebetween to permit the fabric being washed and scoured to pass through said space between said cylinder side wall and the interior of said tub,

a series of pairs of washing liquid jet ejectors with each of one of the ejectors of said pairs of ejectors mounted inside said cylinder and communicating with said space between said cylinder side wall and the interior of said tub through said perforated wall of said cylinder, and with each of the other of the ejectors of said pairs of ejectors mounted outside said tub and communicating with said space between said cylinder side wall and the interior of said tub through said at least one opening in said wall of said tub,

said one of the ejectors and said other of the ejectors of each of said pairs of washing liquid ejectors mounted for emitting opposing jet flows of washing liquid toward each other from said ejectors, and

means for producing a pulsating flow of washing liquid from said ejectors, connected to said ejectors.

4,050,271

APPARATUS FOR REPAIRING INDENTIONS IN A RIGID SKIN

Noel C. Jones, Frederick, Okla., assignor to Noel C. Jones & Associates, Inc., Frederick, Okla.

Continuation-in-part of Ser. No. 481,168, June 20, 1974, Pat. No. 3,977,230. This application May 7, 1976, Ser. No. 684,399

Int. Cl.² B21D *1/12*; B21C *51/00*

U.S. Cl. 72—37 **7 Claims**

1. An apparatus for repairing a dented portion of a metal skin, comprising:

a frame;

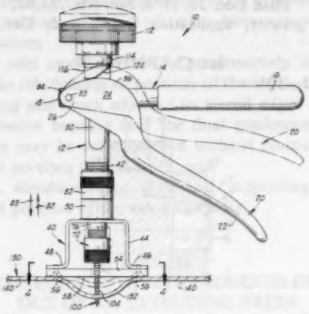
a transparent base plate supported by the frame, the base plate having a clearance aperture extending through the medial portion thereof;

a chuck assembly slidingly supported on the frame on one side of the base plate for movement in a retracting direction away from the base plate;

a dent-engaging member supported by the chuck assembly, the dent-engaging member having a portion extending

through the clearance aperture into engagement with the dented portion; and

means supported by the frame for moving the chuck assembly and the dent-engaging member in the retracting direction whereby the dented portion is drawn toward the base plate to a predetermined position as observed via the transparent base plate.



4,050,272
LOCK ASSEMBLY

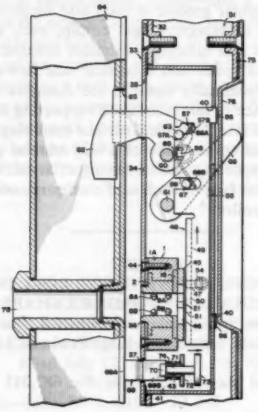
Hiroshi Tanaka, Yoro, Japan, assignor to K.K. Tokai Rika Denki Seisakusho, Japan

Filed May 12, 1976, Ser. No. 685,895

Claims priority, application Japan, May 20, 1975, 50-67459[U]

Int. Cl.² E05B *65/08*

U.S. Cl. 70—100 **5 Claims**



1. A lock assembly for sliding doors comprising:

a. a cylindrical lock having a rotor case and a rotor, said rotor having pin members disposed circumferentially about said rotor and configured such that upon insertion of an associated key into said rotor, said pin members retract and said rotor is rendered selectively rotatable in said rotor case;

b. a movable runner coupled to said rotor, said runner having a slot, said slot having a free-zone channel and a deadlock channel;

c. a rotatable hook member coupled to said runner, said hook member having a pin member configured such that when said hook member is in the unlocked position, said pin member fits into said free-zone channel, and when said hook member is in the locked position, said pin member fits into said deadlock channel; and

d. a driving means movable disposed and coupled to said hook member, whereby said hook member is rotatable by manually actuating said driving means.

4,050,273
CROSS-ROLL FORGING MACHINE

Seiji Tada, Toyama, Japan, assignor to Sato Tekko Co., Ltd., Toyama, Japan

Filed Feb. 13, 1976, Ser. No. 657,988

Claims priority, application Japan, Feb. 19, 1975, 50-23107

Int. Cl.² B21B *27/06*; B21D *37/16*

U.S. Cl. 72—69 **5 Claims**

1. In a cross-roll forging machine of the type comprising means for firmly gripping and rotating a cylindrical workpiece, a pair of holders each adapted to move in opposed relation in a direction transverse to the axis of said cylindrical workpiece and a pair of forging tools mounted on said tool holders, respectively, for forging said workpiece into a desired shape, the improvement comprising

a. electric resistance heating means embedded in each of said forging tools for heating the same,

b. control means for controlling the amount of heat applied by said heating means to said forging tools to control the temperature distribution over each of said forging tools, and

c. a plurality of grooves cut and equidistantly spaced apart from each other of the supporting surface of each of said tool holders.

4,050,274
APPARATUS FOR FORMING GROOVED WHEELS

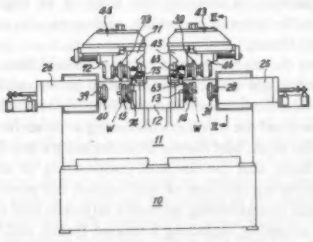
Yoshio Doi, Kariya, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Japan

Filed Apr. 13, 1976, Ser. No. 676,519

Claims priority, application Japan, Mar. 22, 1976, 51-30943

Int. Cl.² B21D *22/14*

U.S. Cl. 72—82 **6 Claims**



1. An apparatus for forming a pair of disk-shaped metal blanks into grooved wheels comprising:

a support base;

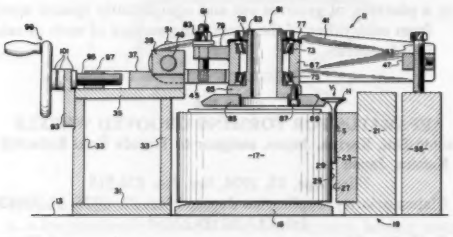
a spindle head mounted on said support base;
a spindle rotatably supported within said spindle head;
means for rotating said spindle;
a pair of mounting dies mounted on opposite ends of said spindle;
a pair of clamp heads mounted on said support base at opposite sides of said spindle head;
a sleeve slidably received in each of said clamp heads;
a clamp shaft rotatably journalled in said sleeve in coaxial relation with said spindle;
means for moving said sleeve in an axial direction;
a clamp die mounted on one end of said clamp shaft for clamping a blank in cooperation with said mounting die;
a pair of brackets rotatably supported on said support base;
a pair of carriers supported on each of said brackets and spaced from each other in an axial direction of said spindle;
a roller shaft rotatably journalled between said pair of carriers;
a roller carried on said roller shaft for forming the blank into a grooved wheel;
one of said pair of carriers being fixedly supported on said bracket and the other carrier being slidably supported in said bracket for a sliding movement in an axial direction of said roller shaft, whereby one end of said roller shaft is disengaged from said slidable carrier by a sliding movement thereof;
means for independently rotating said pair of brackets; and
means for individually restricting rotational movements of said brackets.

4,050,275

METHOD AND APPARATUS FOR ALIGNING A VALVE HEAD

Fred Schlegel, Ceresco, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 14, 1975, Ser. No. 632,125
Int. Cl.² B21B *1/20, 1/42*
U.S. Cl. 72—92 **13 Claims**



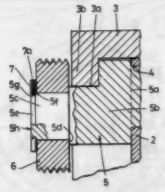
1. Apparatus for aligning the head of an engine valve in relation to the stem of the valve, said apparatus comprising:
a. a first frame;
b. a first die member fixed relative to said first frame;
c. a second die member mounted to be rotatable relative to said first die member and said first frame, each of said first and second die members including a die surface for engaging the stem, said die surfaces defining a gap for receiving the stem, said die surfaces cooperating to straighten the stem during rotation of said second die member;
d. a head straightening assembly adjacent said die members, said assembly including a second frame, and a straightening wheel freely rotatably supported by said second frame;
e. said straightening wheel including a surface disposed to rollingly engage the surface of the valve head as the stem is rolled between said die surfaces.

4,050,276

THREAD-ROLLING HEAD

Harold Habegger, Sous Graitery 10, 2738 Court, Bern, Switzerland

Filed Dec. 22, 1976, Ser. No. 753,527
Claims priority, application Switzerland, Dec. 23, 1975, 16725/75
Int. Cl.² B21H *3/04*
U.S. Cl. 72—104 **1 Claim**



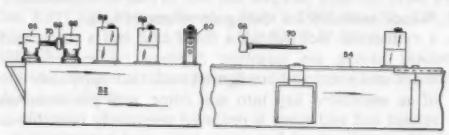
1. In a thread-rolling head of the type wherein three identical support pieces, each including a pivot pin, a supporting journal, and a crank cheek, are rotatingly and non-dispaceably mounted by means of said pivot pins in three respective bearing bores uniformly distributed in a bearing member about the longitudinal axis of said thread-rolling head, each said crank cheek resting against an associated portion of a control surface forming part of a control member rotatable with respect to said bearing member, and each said supporting journal being cantilevered and projecting beyond said control member, and wherein each of three thread rollers is rotatingly borne on a supporting surface of an associated said supporting journal and is held axially between a shoulder surface of a said support piece situated immediately adjacent to a said crank cheek and a circlip disposed on said associated supporting journal, the improvement comprising:
a V-shaped annular groove in each said supporting journal for holding a respective said circlip, each said groove having a flat side forming a shoulder situated adjacent to a said thread roller and a conical side having an outer diameter substantially equal to the diameter of said supporting surface of said associated supporting journal, each said circlip having a conical surface matching and resting against a said conical side of a said annular groove, and each said supporting journal having a flat end face situated flush with the face of each said circlip remote from each said thread roller.

4,050,277

METHOD AND EQUIPMENT FOR ROLL FORMING PRODUCTS OF COMPLEX SHAPE

Richard C. Malott, Spring Lake, and Donald J. Trainer, Ludington, both of Mich., assignors to Leigh Products, Inc., Coopersville, Mich.

Filed May 18, 1976, Ser. No. 687,511
Int. Cl.² B21D *5/08*
U.S. Cl. 72—129 **58 Claims**



39. A method fof forming a product having a complex cross-sectional shape from continuously moving initially flat stock material, comprising the steps of:
bending the stock by progressively varying the angular relationship of longitudinally extending portions of the continuously moving stock;

reverse bending portions of the stock while simultaneously varying the angular relationship of other portions of the stock until at least one portion of the stock is in a substantially vertical plane;

lancing areas of the portion of the stock in a vertical plane after portions of the stock have been reverse bent on themselves;

bending said stock further by progressively varying the angular relationship of portions of the stock;

supporting said stock adjacent its lateral edges so that the progressive bending into the final predetermined cross section may be accomplished without contact with the lanced portions of said stock; and

rotating, simultaneously with said supporting step, the lanced portions of the stock inwardly.

4,050,278

APPARATUS FOR CONVEYING PRODUCTS EXTRUDED OUT OF AN EXTRUDING PRESS

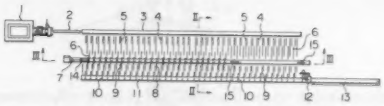
Toyohide Asano, and Masahiro Honda, both of Ube, Japan, assignors to Ube Industries, Ltd., Japan

Filed July 9, 1976, Ser. No. 704,063

Claims priority, application Japan, Aug. 29, 1975, 50-104021

Int. Cl.² B21C *35/02*

U.S. Cl. 72—257 **7 Claims**



1. An apparatus for conveying products extruded out of an extruding press intended for use with a stretcher which is positioned downstream from the extruding press for operations subsequent to the extrusion, comprising a number of beams provided on the side of the stretcher, said beams being reciprocally movable and being inclinable in a direction perpendicular to the axis of the stretcher, and driving means for each of said beams comprising a rack and a pinion, said pinions being rotatably connected to a common rotatable shaft by way of clutch means provided with lever mechanisms arranged between the latter and the side of the stretcher for controlling the clutch means, said lever mechanisms being operated by the displacement of the stretcher to operate the corresponding clutch means.

4,050,279

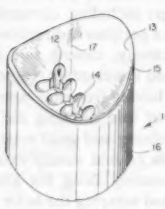
APPARATUS AND METHODS FOR FORMING AN ELONGATED PRODUCT

Francis Joseph Fuchs, Jr., Princeton Junction, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed July 13, 1976, Ser. No. 704,873

Int. Cl.² B21C *25/02*

U.S. Cl. 72—261 **13 Claims**



1. Apparatus for deforming a workpiece so as to form a product composed of one or more substantially adjacent, individual articles, the product having an overall cross-sectional shape which differs from that of the workpiece, said apparatus comprising:

a die having aperture means extending therethrough, said aperture means having an entrance end and including at least one aperture, with said aperture means providing an overall aperture configuration which differs from that of the workpiece and corresponds to said overall cross-sectional shape of the product to be formed, said die also including wall means which converge from an outer periphery of the die toward said entrance end of the aperture means, with each element of the surface of said wall means so converging continuously, along a single linear, substantially radially directed path, and with said elements generally defining a continuous, substantially smoothly flowing surface from element to adjacent element surrounding said entrance end of the aperture means, so as to build up pressure smoothly and continuously within the material of the workpiece as the workpiece is forced against the wall means, the surface of the wall means being further configured such that substantially all of the material of the workpiece first attains said overall cross-sectional shape of the product in substantially the same cross-sectional plane of the die at said entrance end of the aperture means; and

means for forcing the workpiece against said wall means with sufficient pressure to force the workpiece through said aperture means so as to form said product.

4,050,280

ROD ROLLING

Raymond Oliver Sayer, Townsville, Australia, assignor to M.I.M. Rolling Consultants (H.K.) Limited, Hong Kong, Hong Kong

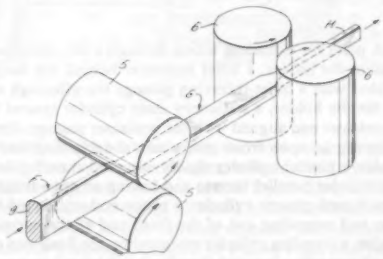
Continuation of Ser. No. 489,059, July 16, 1974, abandoned.

This application Jan. 9, 1976, Ser. No. 647,770

Claims priority, application Australia, Aug. 6, 1973, 4351/73

Int. Cl.² B21B *1/04*

U.S. Cl. 72—234 **2 Claims**



1. A method of reduction of metal rod from stock initially of relative large transverse cross-sectional area, said method comprising:

shaping said stock into a substantially rectangular transverse cross-sectional profile, the longer sides of which are from one and one-half to two and one-half times larger than the shorter sides; then

guiding the stock into the space between a first pair of spaced parallel grooveless rolls with the shorter sides disposed substantially parallel to the work surfaces of the rolls and rollingly compressing the stock through the pair of rolls and with that pair of rolls only while not restraining lateral spreading thereof to reduce the length of the longer sides and increase the length of the shorter sides to the extent that the transverse cross-sectional area of the stock departing from said rolls is less than that of the stock approaching the rolls and the transverse cross-sectional profile of the stock departing from the rolls is substantially rectangular with the longer sides thereof substantially parallel to the work surfaces of the rolls and from one and

one-half to two and one-half times longer than the shorter sides thereof substantially perpendicular to the work surface of the rolls; then

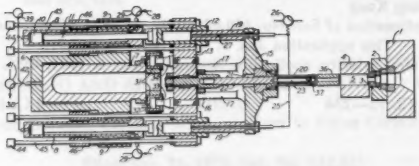
guiding the stock into the space between a second pair of spaced parallel grooveless rolls with the last-mentioned shorter sides disposed parallel to the work surfaces of the second rolls and rollingly compressing the stock through the second pair of rolls and the with second pair of rolls only while not restraining lateral spreading thereof to reduce the length of the last-mentioned longer sides and increase the length of the last-mentioned shorter sides to the extent that the transverse cross-sectional area of the stock departing from said second pair of rolls is less than that of the stock approaching said second pair of rolls and the transverse cross-sectional profile of the stock departing from the second pair of rolls is substantially rectangular with the longer sides thereof substantially parallel to the work surfaces of the second pair of rolls and from one and one-half to two and one-half times longer than the shorter sides thereof substantially perpendicular to the work surfaces of the second pair of rolls.

4,050,281

EXTRUSION PRESS WITH MULTIPURPOSE SIDE CYLINDERS

Guenter W. Sibler, Pittsburgh, Pa., assignor to Sutton Engineering Company, Pittsburgh, Pa.

Filed Jan. 2, 1976, Ser. No. 646,408
Int. Cl.² B21C *23/08*; B30B *11/30*
U.S. Cl. 72—265 **4 Claims**



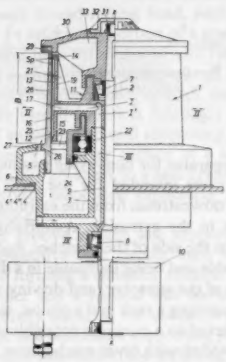
1. A press for extruding billets through a die, comprising an extrusion die holder, a billet container behind the die holder provided with a billet-receiving passage therethrough aligned with the die holder, a stationary main cylinder spaced behind the container and aligned with the container passage, the cylinder having an open front end, a ram slidably disposed in the cylinder, a piercer cylinder rigidly mounted at each side of the main cylinder parallel thereto and having an open front end, a piston in each piercer cylinder, a piston rod connected to each piston and extending out of the front end of the surrounding cylinder, a coupling cylinder mounted on the front end of each rod and extending forward therefrom and having an open front end, a piercer crosshead in front of the ram rigidly connected to said coupling cylinders, an extrusion crosshead in front of the piercer crosshead, means extending past the piercer crosshead and rigidly connecting the extrusion crosshead to said ram for movement by it, plungers slidably disposed in said coupling cylinders and rigidly connected with the extrusion crosshead, a hollow stem mounted on the extrusion crosshead and extending forward therefrom in axial alignment with said container passage for insertion therein, the extrusion crosshead having an opening through it behind the stem, a mandrel holder carried by the piercer crosshead and extending forward through said opening, a mandrel in said stem supported by said mandrel holder and having a tip at its front end of smaller diameter than the mandrel body behind it, means for supplying hydraulic fluid to the rear ends of the piercer cylinders while fluid is locked in the coupling cylinders to move said stem forward to the billet container, means for then exhausting fluid from the coupling cylinders to permit the forwardly moving piercer crosshead to move the mandrel forward from the stem into said container, stops behind the piercer crosshead connected with that crosshead for movement thereby, abutment means engageable by said stops to arrest the forward movement of the piercer crosshead as soon as only said tip of the mandrel projects into a die in the die holder, and means for then supplying hydraulic fluid to said main cylinder and the coupling cylinders to move said stem forward into the container with the full power of the press to extrude a billet through the die while the piercer crosshead and mandrel are held stationary by said stops.

4,050,282

INNER COOLING SYSTEM ON DRAWING DIE DRUMS

Günter Herzog, Hemer-Deilinghofen, Germany, assignor to Ernst Koch & Co., Hemer-Ihmert, Germany

Filed Nov. 29, 1976, Ser. No. 745,798
Claims priority, application Germany, Nov. 27, 1975, 2553215
Int. Cl.² B21C *9/00*
U.S. Cl. 72—286 **8 Claims**



1. Inner cooling system on drawing die drums, particularly for the working of wires, comprising

a rotating drawing die drum having an inner jacket wall,

an inner insert extending substantially across the width of said drawing die drum and slightly spaced from said inner jacket wall of said drawing die drum defining a small rotational gap therebetween, said inner insert being stationarily mounted relative to said rotating drawing die drum,

said inner insert including vertical axially extending ribs dividing said inner insert into a plurality of individual chambers lying angularly spaced one behind the other in a peripheral direction by said axially extending ribs,

said inner insert including circumferential peripheral ribs extending in a peripheral direction on an upper and lower edge, respectively, closing said individual chambers at said upper and lower edges, respectively,

all of said ribs having free ends being adjusted to said inner jacket wall of said drawing die drum spaced opposite therefrom defining said small rotational gap therebetween, said free ends of said axially extending ribs constituting scrapers extending along the axial length of said inner jacket wall and scraping the latter clean during rotation of said drawing die drum,

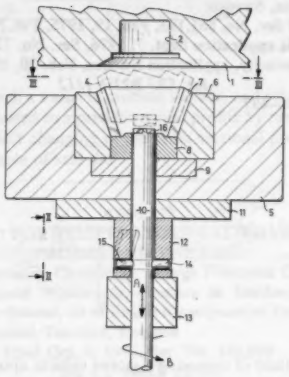
feed conduit means for a continuous refreshing cooling medium flow-wise communicating with said individual chambers for supplying cooling medium thereto.

4,050,283

METHOD AND APPARATUS FOR FORGING BEVEL GEARS

Franz Schober, Munich, Germany, assignor to Bayerisches Leichtmetallwerk Graf Blucher von Wahlstatt KG, Munich, Germany

Filed June 12, 1975, Ser. No. 586,216
Claims priority, application Germany, June 20, 1974, 2429543
Int. Cl.[2] B21D *22/02, 45/00;* B21K *1/30*
U.S. Cl. 72—344 6 Claims



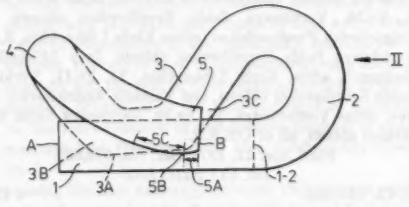
1. Apparatus for forging helical-toothed or spiral-toothed gear elements comprising a mold having an axially movable die and a stationary die, said stationary die having a peripheral wall and a bottom wall of an internal configuration for forming the teeth of said gear elements, an ejector pin mounted to extend freely through the bottom wall of said stationary die along the central axis thereof, the front face of said ejector pin being provided with means for forming a cooperating keying means with the gear being formed and means for supporting said ejector pin in fixed position during formation of said gear element and for axially and rotationally moving said ejector into said die on completion thereof, said means for moving said ejector pin including means for limiting said movement to a vector corresponding to the pitch of the teeth formed on said gear, thereby simultaneously rotating and ejecting said gear from the stationary die.

4,050,284

FASTENING MEMBER FOR ANCHORING A RAILWAY RAIL

David William Miller, Retford, England, assignor to Pandrol Limited, London, England

Filed May 3, 1976, Ser. No. 682,792
Claims priority, application United Kingdom, May 7, 1975, 19251/75
Int. Cl.[2] B21D *11/10*
U.S. Cl. 72—384 19 Claims



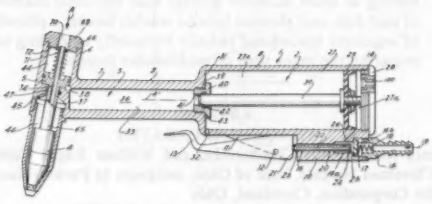
1. A method of making a railway rail-fastening clip comprising subjecting a rod of resilient metal at least 0.8 centimeter thick to a first bending operation which results in the rod having, proceeding from one end of the rod to the other end, a first portion which is a substantially straight leg, a second portion which is a reverse bend, a third portion which is beside the first portion, then a fourth portion and then a fifth portion, the bent rod being such that when it is placed in a particular orientation with the first portion horizontal and the rod is viewed from above the third and fifth portions appear to be on opposite sides of the axis of the first portion, and then subjecting the bent rod to a second bending operation which results in said other end of the rod being up-turned and which comprises causing a first shaping tool to force into contact with a second shaping tool the whole of that part of the length of the rod which, when the finished clip is in a particular position, in which the lowermost points on both ends of the first portion lie in a horizontal plane, the lowermost points on the third and fifth portions lie in another horizontal plane and the fourth portion crosses and lies above the axis of the first portion, is between the lowermost point on the fifth portion and said other end of the rod.

4,050,285

AIR-HYDRAULIC BLIND-RIVETING TOOL WITH SHORT RESET TIME

Karl Bosch, Hermaringen, Brenz, and Max Fritzenschaft, Giengen, Wurttemberg, both of Germany, assignors to Adolf Diener, Apparate- U. Maschinenbau, Hermaringen, Germany

Filed Apr. 21, 1975, Ser. No. 569,709
Claims priority, application Germany, Apr. 20, 1974, 2419190; Apr. 20, 1974, 7413845[U]
Int. Cl.[2] B21J *15/34*
U.S. Cl. 72—391 6 Claims



1. A tool for setting a blind rivet, said tool comprising:

a housing forming an air chamber, a liquid-filled hydraulic chamber adjacent thereto, and a liquid-filled working chamber communicating with said hydraulic chamber;

a working piston in said working chamber and carrying a chuck for grasping a mandrel of a blind rivet, said piston being displaceable in said working chamber between a ready position wherein a mandrel can be fitted into said chuck and an actuated position wherein said chuck is retracted;

an air piston in said air chamber subdividing same into a front compartment and a rear compartment and displaceable between a front position of maximum volume of said rear compartment and minimum volume of said front compartment and a rear position of minimum volume of said rear compartment and maximum volume of said front compartment, said housing being formed at the front end of said front compartment with a first throughgoing hole for gas flow between same and the atmosphere and at the rear end of said rear compartment directly in a wall thereof with a second throughgoing hole for gas flow between same and the atmosphere;

a hydraulic piston carried on said air piston and displaceable in said hydraulic chamber between an advanced position pressurizing said hydraulic chamber and corresponding to said front position of said air piston and a retracted position corresponding to said rear position of said air piston;

first valve means for admitting, when actuated, pressurized

air into said rear compartment and thereby displacing said air piston into said front position, displacing said hydraulic piston into said advanced position, and displacing said working piston into said actuated position;

second valve means on said wall in said second hole and responsive to air pressure for blocking air flow from said rear compartment out through said second hole when said first valve means is actuated to admit compressed air to said rear compartment and for opening and allowing air flow from said rear compartment out through said second hole when said first valve means is not actuated, said air chamber being generally cylindrical and said housing having an end cap constituting a rear wall of said air chamber, said second valve means being provided in said end cap; and a spring braced between said housing and said working piston and urging same into said ready position, whereby displacement of said working piston from said retracted position into said ready position by said spring absent actuation of said first valve means automatically displaces said air piston into said rear position and forces air out of said rear compartment through said second hole, said second valve means including:

a valve seat formed at said second hole,

a valve disk sealing engageable over said seat to block gas flow from said rear compartment,

a valve spring braced between said housing and said disk and urging same away from said seat,

an abutment element, said valve spring normally pressing said disk against said element, said element being formed with at least one gap for air flow through said second hole when said disk lies against said element, and

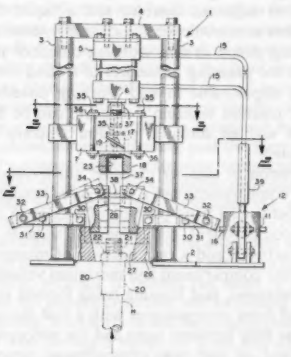
a tubular spring housing fixed in said end cap and formed with a shoulder having said seat, said spring housing having an inner diameter greater than the outer diameter of said disk, said element being a washer having a plurality of angularly spaced and radially outwardly extending tabs engaging the inner wall of said tubular housing.

4,050,286

SWAGING APPARATUS

James Mills Gasier, Timberlake, and William Edgar Currie, Cleveland Heights, both of Ohio, assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Oct. 15, 1976, Ser. No. 732,758
Int. Cl.² B21D *41/00*
U.S. Cl. 72—416 **22 Claims**



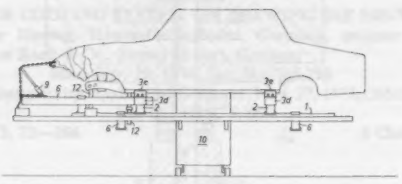
1. In swaging apparatus of the type wherein a pusher pushes an article to be swaged downwardly into a cavity of a closed die defined by mating segmental die members and wherein die opening means are operative during upward retraction of said pusher to open said die by upward and lateral separating movement of said die members thus to release the swaged article for downward discharge from between said die members; the combination therewith of actuating means on said pusher engageable with said die opening means to open said die in response to upward retraction of said pusher; and means for disengaging said actuating means and die opening means prior to downward movement of said pusher in swaging direction to release said die members for movement into mating engagement.

4,050,287

METHOD FOR VEHICLE ALIGNMENT

Jörgen Borup, Vaxjo, Sweden, assignor to AB Nike Hydraulik, Eskilstuna, Sweden

Division of Ser. No. 551,193, Feb. 19, 1975, Pat. No. 4,023,394.
This application Sept. 7, 1976, Ser. No. 720,525
Claims priority, application Sweden, Feb. 20, 1974, 7402252
Int. Cl.² B21D *1/12*
U.S. Cl. 72—457 **1 Claim**



1. A method of mounting a motor vehicle upon frame apparatus of the type adapted for applying forces to selected portions of the damaged vehicle body structure to restore the vehicle body and/or frame to its original configuration and for concurrently making measurements relative to selected datum points, said method comprising the steps of:

securing to the underside of the vehicle body a plurality of parallel, generally horizontal spaced rigid supporting beams each transverse to the longitudinal axis of the vehicle,

raising the vehicle with the transverse beams secured thereto a sufficient distance to permit the insertion underneath said transverse beams of a rigid, substantially rectangular frame whose width is less than the length of the transverse beams and whose length exceeds that of the vehicle body,

rigidly securing each said transverse beam to said rigid frame at each intersection of a transverse beam with a structural member of the rigid frame,

and securing force-applying means to said rigid frame for application of forces to selected portions of the vehicle body.

4,050,288

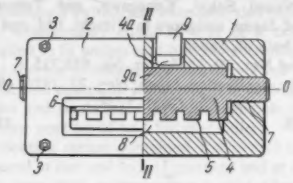
DIE FOR EXTRUDING ARTICLES WITH VARIABLE CROSS-SECTION PROFILE

Vladimir Borisovich Zaikovsky, ulitsa Mishina, 12, kv.19; Jury Prokhorovich Kutuzov, ulitsa Gvardeiskaya, 1, kv.90; Mikhail Fedorovich Zakharov, ulitsa Tolbukhina, 12, Kv.19, all of Moscow; Evgeny Emelyanovich Kavtaev, ulitsa Karla Marxa 3, kv.34, Verkhnaya Salda Sverdlovskoi oblasti; Jury Grigorievich Poedinschikov, ulitsa Karla Libknekhta, 8, kv.1, Verkhnaya Salda Sverdlovskoi oblasti; Jury Mikhailovich Bazhanov, ulitsa Karla Libknekhta, 12, kv.11, Verkhnaya Salda Sverdlovskoi oblasti, and Valentin Andrianovich Schapov, ulitsa Vostochnaya, 12, kv.10, Verkhnaya Salda Sverdlovskoi oblasti, all of U.S.S.R.

Filed Apr. 21, 1976, Ser. No. 678,885
Int. Cl.² B21C *3/06*
U.S. Cl. 72—468 **4 Claims**

1. An extruding die for extruding articles with a variable cross-sectional profile, comprising: a stationary bearing component; a pair of components mounted on said bearing component and together forming a hole or aperture for said extruding die; one of said components is rigidly mounted on said bearing

component; and the other of said components is rotatably mounted opposite said rigidly mounted component, and is provided in the form of a component with a periphery repre-



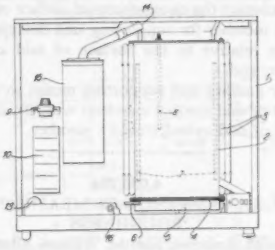
senting by itself a variable profiled surface, and rotatable component is adjusted to a predetermined profile by rotation about its axis to effect changing of the cross-sectional profile of said aperture or hole of said die.

4,050,289

METHOD FOR TEMPERATURE CALIBRATION OF PROBES AND THE LIKE

Geoffrey Fairbairn, Chesterton; George Frederick Cooke, Royston; Reginald Winkworth, Western in Gardano, and Jan Koreki, Portishead, all of England, assignors to Techne (Cambridge) Limited, Duxford, England

Filed Oct. 8, 1976, Ser. No. 731,086
Int. Cl.² G01K *15/00*
U.S. Cl. 73—1 F **14 Claims**



1. A method for calibrating at least one temperature sensor in a fluidized bath, comprising the steps of:

embedding said to-be-calibrated at least one sensor and a reference temperature sensor in a medium having low thermal capacity and high thermal conductivity; placing said embedded sensors and said medium within a mass of confined particulate material which is in an at least partial fluidized state;

subjecting said mass for a predetermined period of time to a controlled rate of flow of a gaseous medium to establish and maintain said mass in a fluidized state while simultaneously the said gaseous medium is performing heat exchange with said particulate material until a first selected value of temperature of said particulate material has been attained, the rate of flow of said medium being maintained constant and the rate of flow being according to the temperature developed in the heat exchange to compensate for thermal expansion of said gaseous medium in order to maintain said fluidized bath at a substantially constant level;

increasing the heat exchange between said gaseous medium and said material while changing the rate of flow according to the temperature of the gaseous medium for said thermal expansion compensation until a second temperature value of said material is attained, said second temperature value being a predetermined incremental change from said first temperature value, said second value being that at which said calibration is to be made;

simultaneously terminating the rate of flow of said gaseous medium to, and heat exchange with, said particulate material to change said material from a fluidized state to a quiescent state for a predetermined period of time to complete heat exchange transfer between said material and said embedding medium until the temperature of said embedding medium surrounding said sensors becomes substantially stabilized at said second temperature value;

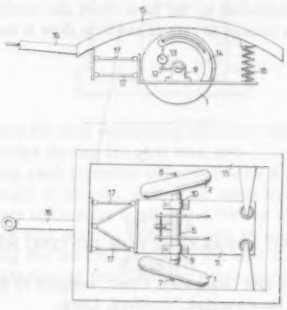
recording the indications of said temperature sensors while the supply of gaseous medium to, and the heat exchange with, said particulate material remains terminated and said second temperature value is stabilized.

4,050,290

DEVICE FOR MEASURING FRICTION BETWEEN WHEEL AND SUPPORT

Börje Arne Gunnar Lönnroth, Abiskovagen 6, Vallingby, Sweden (S-162 25)

Filed Nov. 26, 1975, Ser. No. 635,352
Claims priority, application Sweden, Nov. 27, 1974, 7414859
Int. Cl.² G01N *19/02*
U.S. Cl. 73—9 **8 Claims**



1. A device for measuring friction between wheel and support comprising:

a. at least one wheel with a wheel suspension means permitting the wheel to rotate about a rotation axis line;

b. means for moving the wheel suspension means with the wheel rolling on the support and somewhat inclined to the direction of movement; and

c. measuring means for measuring the turning moment about a line being on the whole horizontal and substantially perpendicular to the direction of movement, which moment is produced on the wheel suspension means by the forces arising at the movement in the contact surface between the wheel and support.

4,050,291

FILTER CONDITION RESPONSIVE DEVICE COMPENSATED FOR CHANGES IN MEDIUM FLOW

Lorne W. Nelson, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

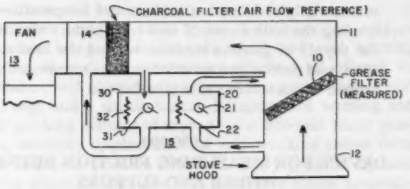
Filed Sept. 27, 1972, Ser. No. 292,575
Int. Cl.² G01N *15/08*
U.S. Cl. 73—38 **6 Claims**

1. A filter condition responsive apparatus for responding to the presence of a predetermined collection of material in a filter from the medium flowing through a pipe and through the filter comprising,

differential pressure responsive means adapted to be connected to the pipe on each side of the filter to respond to the drop in pressure of the medium flowing in the pipe due to the restriction produced by the filter, said differential

pressure increasing as the filter collects material from the medium and being effected by a change in the rate of flow of the medium through the filter, said means providing a first output,

flow responsive means adapted to be connected to the pipe to provide a second output indicative of the rate of flow of medium through the pipe,



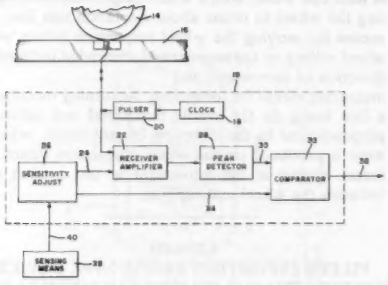
and comparison means connected to said differential pressure response means and said flow responsive means for comparing said first and second outputs, said comparison means providing an output only indicative of the change in pressure drop across said filter due to the presence of material collected in the filter from the medium as the effect of a change in rate of medium flow is cancelled.

4,050,292

METHOD AND APPARATUS FOR TESTING RAILROAD WHEELS

Peter K. Bloch, Old Greenwich, Conn., assignor to Krautkramer-Branson, Incorporated, Stratford, Conn.

Filed Oct. 18, 1976, Ser. No. 733,444
Int. Cl.² G01N *29/04*
U.S. Cl. 73—67.5 R **9 Claims**



1. A method for testing railroad wheels in a test zone comprising the steps of:

sensing the presence in the test zone of a wheel falling within a first category or a wheel falling within a second category and providing a corresponding control signal;

transmitting an acoustic energy search signal into the wheel and receiving defect responsive echo signals therefrom;

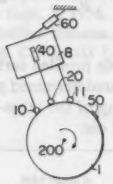
selectively detecting responsive to said control signal defects of a first magnitude in a wheel falling within said first category and defects of a second magnitude in a wheel falling within said second category.

4,050,293

DEVICE FOR DETECTING THE UNEVENNESS OF A CURVED SURFACE

Raiji Shimomura, Kokubunji; Toru Habu, Hachioji; Hisaaki Itoh, Mie; Naomi Sakai, Kanagawa, and Tatsuo Goto, Hamura, all of Japan, assignors to Hitachi, Ltd. and Hitachi Metals, Ltd., both of, Japan

Filed Nov. 20, 1975, Ser. No. 633,715
Claims priority, application Japan, Nov. 27, 1974, 49-135491
Int. Cl.² G01B *5/28*
U.S. Cl. 73—105 **18 Claims**



1. A device for detecting the unevenness of a circumferential surface of a cylindrical-like member comprising:

means for seizing the cylindrical-like member;

means for rotating said seizing means such that said cylindrical-like member is rotated about an axis of rotation;

means for detecting at least one projection or recess on the circumferential surface of said cylindrical-like member;

supporting means including at least two contact members which contact the circumferential surface of said cylindrical-like member for supporting said detecting means at a position relative to the surface of said cylindrical-like member; and

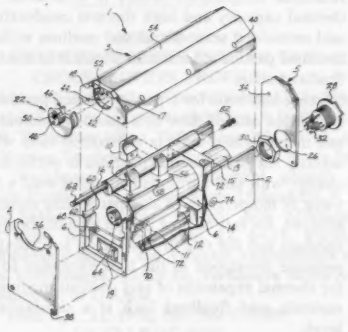
means for guiding said supporting means so as to maintain contact of said contact members with the circumferential surface of said cylindrical-like member.

4,050,294

APPARATUS AND METHOD OF MEASURING SURFACE ROUGHNESS

Michael Joseph Andrews, Seattle; William Allen Davis, North Bend, and Roger Alvin Senske, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed July 6, 1976, Ser. No. 702,840
Int. Cl.² G01B *5/28*
U.S. Cl. 73—105 **10 Claims**



1. An apparatus for measuring the finish of the interior surface of a fastener hole comprising:

a case;

a probe containing a stylus and transducer therein to convert vertical motions of said stylus as it traverses surface irreg-

ularities into electrical signals by said transducer, said probe mounted to a carriage means slidably mounted within said case;

a pilot adapted to removably fit upon said case, said pilot containing a cylindrical extension thereupon with a diameter substantially equal to that of a fastener hole and adapted to fit within said hole, said extension containing a hole therein to encompass said stylus and probe such that when said extension is inserted into said fastener hole said stylus and probe pass through said hole and contact the interior portion of said fastener hole;

reciprocating means contained within said case, said means secured at one end to said carriage and at the other end to said case, said reciprocating means adapted to slidably move said carriage means within said case;

means for determining the position of said carriage means as said carriage means slidably moves within said case;

means for electronically presetting the position of said carriage;

means for electronically comparing the position of said carriage means with a plurality of selectable carriage positions, said means causing said carriage means to slidably reverse its direction of travel when said carriage means reaches said positions; and

means for displaying said electrical signals produced by said stylus and said transducer.

4,050,295

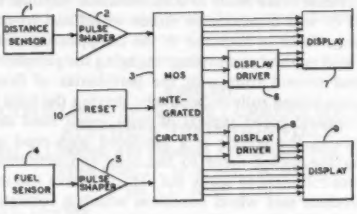
DIGITAL MEASURING SYSTEM FOR ENGINE FUEL PERFORMANCE

Norman L. Harvey, 381 Ocean Ave., Marblehead, Mass. 01945

Filed Sept. 12, 1975, Ser. No. 612,682

Int. Cl.² G01F *9/00*

U.S. Cl. 73—114 **23 Claims**



1. A fuel consumption measuring apparatus for fuel powered vehicles comprising; a distance traveled sensor connected to the kinetic system for said vehicle which produces electric pulses, the number thereof in proportion to the distance traveled by said vehicle; a fuel flow sensor connected to the fuel system for said vehicle which produces electric pulses, the number thereof in proportion to the per unit fuel flow therein; counting means to count separately the distance pulses and the fuel flow pulses over a selected time period and calculating means to compute the ratio of the two counts for a selected time period to obtain the fuel consumption per distance rate for said vehicle.

4,050,296

RELATIVE COMPRESSION OF AN INTERNAL COMBUSTION ENGINE

Richard S. Benedict, Manchester, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 7, 1976, Ser. No. 684,038

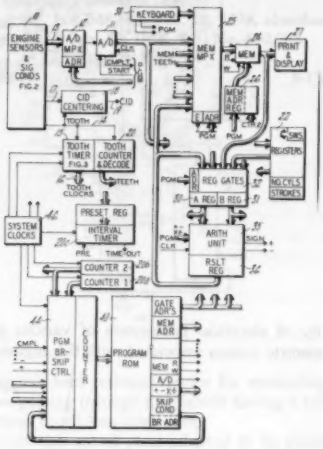
Int. Cl.² G01M *15/00*

U.S. Cl. 73—116 **10 Claims**

1. In a method for providing an indication of relative cylinder compression of a reciprocating internal combustion engine, the steps of:

determining in turn the maxima and minima in the speed of a rotating engine from excursions in magnitude of a signal derived from an engine parameter, the magnitude of which follows excursions in engine speed as a consequence of successive cylinder-related compression strokes, and providing successive manifestations thereof referred to hereinafter as "max" and "min", respectively;

providing the difference between the magnitudes of each



max and the next succeeding min after sensing each min and before sensing the next max; and

comparing each provided difference with a predetermined difference to thereby determine when the speed excursions are sufficiently small that detection of the next succeeding max may be impaired, and in response thereto, utilizing the last min sensed as the next succeeding max and next sensing thereafter the next succeeding min.

4,050,297

MEASURING ELECTRICAL PARAMETERS OF AN INTERNAL COMBUSTION ENGINE DURING CRANKING

James R. Pettingell, Granby, and Lee R. Armstrong, Enfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 7, 1976, Ser. No. 684,032

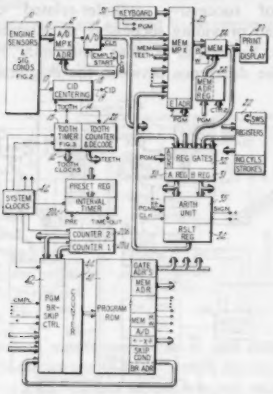
Int. Cl.² G01M *15/00*

U.S. Cl. 73—117.2 **9 Claims**

7. In a method of recording the magnitudes of electrical parameters of a reciprocating internal combustion engine having an electric starter motor, during cranking of the engine, the steps of:

determining the time of an extreme magnitude in the excursions of magnitude of an engine parameter which varies in conjunction with the power required to crank the engine, said magnitude having maxima and minima associated with each cylinder thereof; and

recording in timed relationship with said extreme magnitude of said engine parameter the magnitude of each of a plural-



ity of electrical parameters of various portions of the electric system associated with the engine.

4,050,298

MANUALLY OPERATED CONTROL VALVE AND TESTING APPARATUS INCORPORATING SUCH VALVE

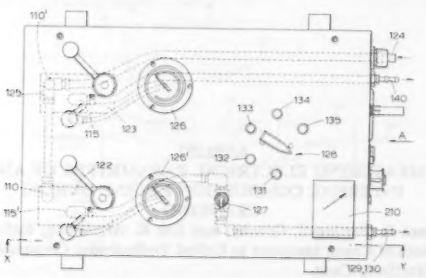
Frederick John Charles Hope, Chobham, and James Malcolm Pigney, Bracknell, both of England, assignors to Hope Technical Developments Limited, Ascot, England

Filed May 10, 1976, Ser. No. 684,823

Claims priority, application United Kingdom, May 8, 1975, 19506/75; Aug. 29, 1975, 35759/75

Int. Cl.[2] G01L *5/28*

U.S. Cl. 73—121 **9 Claims**



1. A manually-operated control valve including manual operating means for controlling the supply and exhaust of a working fluid to and from a fluid operable system which comprises a housing having an inlet for the working fluid and an outlet for delivering working fluid to the system, a pressure-regulating valve disposed between said inlet and said outlet and an exhaust valve for exhausting fluid from the system, said regulating valve and said exhaust valve each including actuating means comprising plungers which are operable by a single manual operating means.

4,050,299

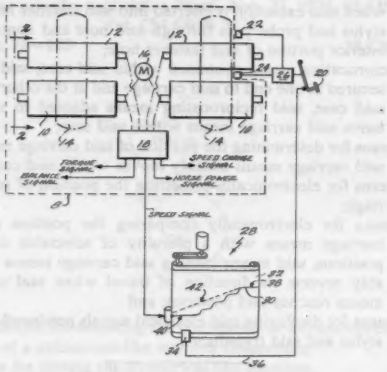
BRAKE TESTING METHOD

Lloyd R. Maxwell, Bradford Hills, Downingtown, Pa. 19335

Continuation-in-part of Ser. No. 555,813, March 6, 1975, Pat. No. 3,979,950. This application Sept. 7, 1976, Ser. No. 720,642

Int. Cl.[2] G01L *5/28*

U.S. Cl. 73—126 **3 Claims**



1. A method of testing an anti-skid brake system installed in a wheeled vehicle, said brake system including a driver-actuated brake pedal and a control system having first and second sensors associated with the first and second wheels respectively for sensing a condition of the respective wheel which is indicative of imminent lock-up and a control circuit which in its normal operating mode is responsive to both sensors to release brake force to both wheels in response to the occurrence of said condition at either wheel and to rapidly reapply brake force in response to the disappearance of said condition, said method comprising: engaging the peripheries of the first and second rolls with the peripheries of first and second motor-driven rolls respectively, driving the rolls up to a high peripheral speed typical of high speed road driving thereby driving the wheels at a simulated high road speed, maintaining the motor drive to the rolls and actuating the brake system sufficient to apply the vehicle brakes and insufficient to produce said wheel condition which is indicative of imminent wheel lock-up, effecting said condition at said first wheel by releasing the motor drive to said first roll while maintaining the motor drive to said second roll, generating a signal at least in part from the sensed speed of either of the wheels, said signal having a predetermined characteristic which varies with said speed whereby said signal indicates whether said control system has been operated in its normal mode by the sensor associated with said one wheel, reapplying the motor drive to said one roll, effecting said condition at said second wheel by releasing the motor drive to said second roll while maintaining the motor drive to said first roll, and generating a system at least in part from the sensed speed of either of the wheels, said signal having a predetermined characteristic which varies with said speed whereby said signal indicates whether said control system has been operated in its normal mode by the sensor associated with said second wheel.

4,050,300

TORQUE INDICATING ASSEMBLY

John W. Turner, and Russell A. McLaughlin, both of Houston, Tex., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Apr. 28, 1976, Ser. No. 681,870

Int. Cl.[2] G01L *5/24*

U.S. Cl. 73—139 **8 Claims**

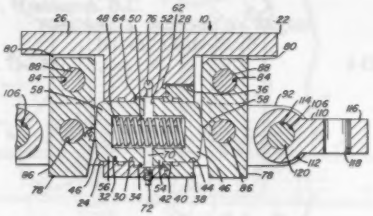
1. A torque indicator assembly comprising:

a body member;

variable volume chamber means carried by said body member and operable to receive a fluid therewithin;

said chamber means having a pair of opposed oppositely biased movable portions;

force responsive means carried by said body member and operable to increase the pressure of the fluid within said chambers by moving one of said opposed portions when an external force is applied in a first direction and by moving the other of said opposed portions when such an external force is applied in a direction opposite said first direction;



said force responsive means including spaced portions pivotally carried by said body member and responsive to such an external force in a manner that one of said spaced portions pivot to move a first of said opposed portions while the other of said spaced portions simultaneously pivots in a direction away from the second of said opposed portions;

indicating means communicating with said chamber means and responsive to the pressure of the fluid within said chamber means;

and at least one link portion communicating between said spaced portions and pivotally carried thereby adjacent respective end sections of said link portion.

4,050,301

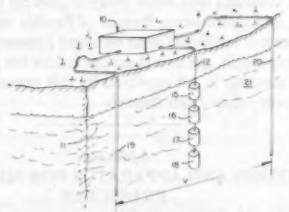
ELECTROMAGNETIC WATER CURRENT METER WITH SYNTHETIC DIRECTION FIELD

Vincent J. Cushing, 410 Standish Drive, Deerfield, Ill. 60015

Filed May 27, 1976, Ser. No. 690,747

Int. Cl.² G01F *1/58*

U.S. Cl. 73—189 **19 Claims**



1. A device for producing signals representative of orthogonal flow velocity components with reference to a known coordinate system, including an electromagnetic flow transducer, producing signals representative of orthogonal flow velocity components with reference to an unknown coordinate system, which further includes,

an artificial field generator for producing a field with predetermined orientation relative to said known coordinate system,

sensing means, integral with said transducer, for sensing orthogonal components of said field in said unknown coordinate system, and producing signals related thereto,

signal responsive means, responsive to said transducer-produced signals, and to said sensing means-produced signals for providing signals representative of orthogonal flow velocities in said known coordinate systems.

4,050,302

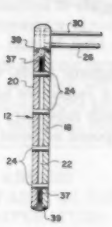
THERMOELECTRIC HEAT FLOW TRANSDUCER

Warren E. Haupin, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 548,401, Feb. 10, 1975, abandoned. This application Feb. 23, 1976, Ser. No. 660,264

Int. Cl.² G01K *17/00*

U.S. Cl. 73—190 H **5 Claims**



1. A thin, rugged, heat resistant device for measuring the rate of heat flow passing through a structure having a surface exposed to ambient conditions comprising

a first, relatively thin metal plate adapted to be placed in direct physical contact with the exposed surface of the structure passing heat,

a second, relatively thin metal plate located in spaced, rigid, parallel relation with said first plate and generally coextensive therewith to form a sandwich-like structure having a relatively narrow space between the plates,

a plurality of spaced openings provided in and extending through said first and second places, and

a plurality of relatively short, structural, thermal conductors extending through said openings and plates and bridging the narrow space therebetween to provide a plurality of heat paths between the plates, the conductors being made of a material having a relatively high coefficient of thermal conductivity, and capable of supporting the plates in said rigid, parallel relation, said conductors in combination with at least one of said plates providing a plurality of differential thermocouples, the conductors being in intimate, physical contact with each plate so that, in addition, good heat conduction is provided between each conductor and each plate whereby the impedance to and the disturbance of the rate of heat flow through the structure being measured is such that a temperature drop is established between the metal plates to provide a temperature representing signal without substantially altering normal heat flow through the structure.

4,050,303

FLUID FLOW METERS

John Hemp, Marston, and Derek Gerald Wyatt, Oxford, both of England, assignors to National Research Development Corporation, London, England

Filed May 27, 1976, Ser. No. 690,784

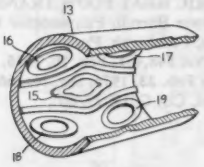
Claims priority, application United Kingdom, May 27, 1975, 23179/75

Int. Cl.² G01F *1/58*

U.S. Cl. 73—194 EM **5 Claims**

1. An electromagnetic flowmeter for measuring the rate of fluid flow in a duct of circular cross-section, comprising a pair of electrodes disposed at diametrically opposed positions on the duct, main winding means for producing a main magnetic field in the duct extending transversely between the electrodes to establish a signal across the electrodes, and first, second,

third and fourth subsidiary winding means spaced around the main winding means for producing respective subsidiary magnetic fields having components parallel to but in the opposite direction to the main magnetic field in the duct, the first and



second subsidiary (magnetic fields) winding means each being disposed adjacent to a respective electrode upstream thereof and the third and fourth subsidiary (magnetic fields) winding means each being disposed adjacent to a respective electrode downstream thereof.

4,050,304

APPARATUS FOR MEASURING MASS FLOW OF FLUIDS

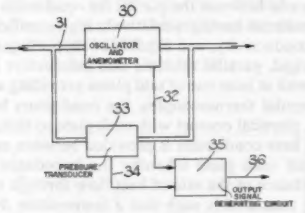
Alan Thomas, Stratford-on-Avon, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Sept. 27, 1976, Ser. No. 727,229

Claims priority, application United Kingdom, Oct. 4, 1975, 40704/75

Int. Cl.² G01F *1/32, 1/76*

U.S. Cl. 73—194 B **3 Claims**



1. An apparatus for measuring the mass flow rate of fluids, comprising a fluidic oscillator, the frequency of oscillation of which is a function of the volume flow rate therethrough, means for generating a first electrical signal dependent on said frequency of oscillation, means for generating a second electrical signal dependent on the pressure difference across said oscillator, and means, responsive to said first and second electrical signals, for generating an output signal proportional to

$$2Sc_o^{3/2}A_o^2 \cdot P/f$$

where

S = Strouhal number of said oscillator

c_o = coefficient of said oscillator

A_o = equivalent area of said oscillator

and are fixed functions of said oscillator, and P and f respectively are said pressure difference and said frequency of oscillation.

4,050,305

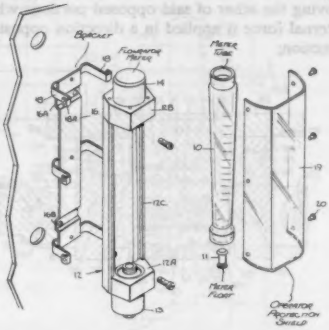
SHIELD AND BRACKET ASSEMBLY FOR FLOWMETER

Daniel J. Evans, Feasterville, and Hubert Riester, Huntingdon Valley, both of Pa., assignors to Fischer & Porter Company, Warminster, Pa.

Filed Oct. 6, 1976, Ser. No. 730,073

Int. Cl.² G01F *15/10*

U.S. Cl. 73—209 **5 Claims**



1. In combination with a standard flowmeter in which an open-ended variable-area flow tube subject to breakage is supported in an upright position within a meter body having a rear wall in a manner exposing all but the rear portion of the tube, whereby the vertical position of a float within the tube may be observed to provide a reading of flow rate, a shield and bracket assembly cooperating with said flowmeter to protect personnel in the vicinity of the flowmeter should the tube break in the course of operation, said assembly comprising:

A. a bracket formed by a vertical strip which is secured to the rear wall of said meter body and is provided with resilient arms which project forwardly from opposite sides thereof in spaced relation to the meter body, said arms terminating in fingers; and

B. a channel-shaped transparent plastic shield whose opposing margins are attachable to said fingers of said resilient arms, said shield enveloping the exposed portion of the meter tube to define a safety chamber thereabout which confines explosion products resulting from breakage of the tube and exhausts fluid discharged from the shattered tube rearwardly from the chamber in the space between said arms and said meter body to prevent injury to personnel, said shield being formed of flexible material such that when it is subjected to an outward pressure by the force of an explosion, the shield supported on the resilient arms of the machine is not ruptured by this pressure but yields to accommodate itself thereto.

4,050,306

METHOD AND APPARATUS FOR MEASURING PRESSURES

Syed J. Khalid, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Feb. 27, 1976, Ser. No. 661,980

Int. Cl.² G01L *7/00*; G05D *11/00*

U.S. Cl. 73—212 **12 Claims**

1. An improved pressure sensing probe of the type for placement within a fluid flow chamber downstream of a plurality of spaced obstructions, and delivery of the flow to a pressure sensitive device to obtain an indication of pressure wherein the improvement comprises:

a. a pair of probe tubes having open ends for placement at spaced positions within a fluid chamber for conducting the flow of fluid therefrom; and

comparing means interconnecting the tubes' other ends and adapted to discharge to the pressure sensitive device the

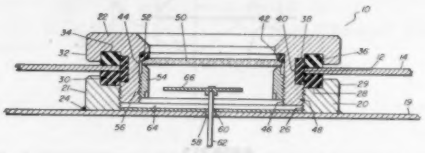
flow only from the tube having the higher pressure when there is a variance of pressure between said spaced positions.

4,050,307

DIAL HUMIDITY INDICATOR FOR CONTAINERS

Willard C. McMullen, Little Falls, N.J.; Samuel Gee, Sr., deceased, late of Denville, N.J.; by Patricia E. Whitney, legal representative, Frankfort, Ill., and by Joan E. Bennett, legal representative, Chula Vista, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 3, 1975, Ser. No. 610,026
Int. Cl.[2] G01N *19/10*
U.S. Cl. 73—337 **5 Claims**



1. A dial humidity indicator for attachment to a container which comprises:

dial indicating and sensing means adapted to be disposed within said container for measuring the percentage of relative humidity therein;

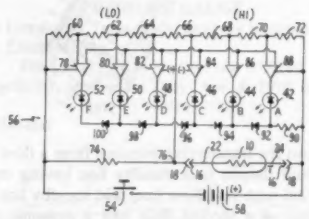
sealed viewing means for observing said indicating means from outside said container; and means, for holding said sensing means and said viewing means to said container so that they are shock isolated therefrom and hermetically sealed thereto.

4,050,308

ELECTRONIC FISH LOCATOR

Jimmy Luther Lee, 1045E Shary Court, Clayton, Calif. 94518

Filed July 22, 1976, Ser. No. 707,563
Int. Cl.[2] G01K *7/24*
U.S. Cl. 73—362 AR **2 Claims**



1. An electronic fish locator, comprising:

a first conductor;

a second conductor;

voltage divider means having a first end terminal connected directly to said first conductor, a second end terminal connected directly to said second conductor, and a plurality of intermediate terminals for producing reference voltages;

temperature signal conductor means;

fixed resistance means having a first terminal directly connected to said first conductor and a second terminal directly connected to said temperature signal conductor means;

temperature sensitive resistance means;

flexible cable means for connecting said temperature sensitive resistance means directly between said second conductor and said temperature signal conductor means;

switch means for connecting a battery between said first conductor and said second conductor;

comparing means for comparing said reference voltages with the voltage of said temperature signal conductor means when said switch means is closed; and

indicating means for indicating the ones of said reference voltages between which the voltage of said temperature signal conductor means lies;

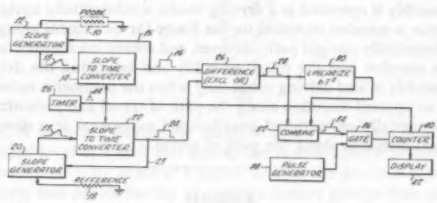
said comparing means comprising a plurality of integrated comparator circuits, said indicating means comprising a plurality of light-emitting diodes, each of said light-emitting diodes being connected to the output terminal of one of said integrated comparator circuits to receive current therefrom, and each pair of light-emitting diodes controlled by signals from adjacent terminals of said voltage divider means being provided with a diode connected between the light-emitting diode terminals which are not connected directly to integrated comparator circuits.

4,050,309

METHOD AND APPARATUS FOR MEASURING TEMPERATURE

Kenneth G. Junkert, Manhattan Beach, and Henry P. Voznick, Arcadia, both of Calif., assignors to William Wahl Corporation, Los Angeles, Calif.

Filed Nov. 4, 1974, Ser. No. 520,232
Int. Cl.[2] G01K *7/16*
U.S. Cl. 73—362 AR **29 Claims**



1. A temperature measuring instrument comprising

first and second resistors,

first and second slope generators connected with said first and second resistors respectively, for generating first and second ramp signals, each having a slope determined by a corresponding one of said resistors,

first and second slope to time converters responsive respectively to said first and second ramp signals for generating first and second time intervals respectively indicative of the slopes of said first and second ramp signals,

timing means for simultaneously repetitively triggering said first and second converters,

means responsive to said first and second converters for repetitively actuating said first and second slope generators in synchronism with each other,

means responsive to both said converters for combining the time intervals produced thereby to generate a measurement signal representative of the difference between said first and second time intervals, and

means for indicating the duration of said measurement signal.

4,050,310

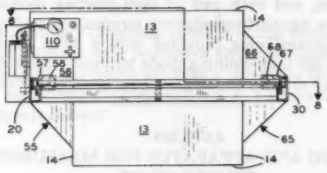
EXERCISING APPARATUS

Dennis L. Keiser, 14634 E. Annadale Ave., Sanger, Calif. 93657

Filed Mar. 17, 1976, Ser. No. 667,611
Int. Cl.[2] G01L *5/02*; A63B *21/20*
U.S. Cl. 73—379 **12 Claims**

6. In an exercising apparatus having a frame, a member

borne by the frame for movement in opposite directions along a substantially upright path of travel, means including a fluid pump operably connected to the member for resisting movement of the member in an upward direction along the path of travel for the application of muscular force to the member in said upward direction against the action of the resisting means, the improvement comprising a latch assembly pivotally mounted on the frame for movement between a raised position in said path of travel and a lowered position out of said path of travel and said latch assembly having an end portion engageable with the member in the raised position to retain the member in a ready position and releasable therefrom by upward movement of said member for gravitational movement of the latch assembly to the lowered position.



7. An exercising apparatus comprising a fluid system containing a fluid, a fluid pump having a plurality of pistons connected to the system and adapted for operation to pump fluid through the system developing a fluid pressure within said system resistant to operation of the pump, a drive assembly linked to the pump and operating the pump only when said assembly is operated in a driving mode, a substantially upright frame, a member mounted on the frame for movement along a substantially upright path of travel, and means interconnecting the member and the drive assembly and operating the drive assembly in said driving mode only when the member is moved in an upward direction along the path of travel and permitting substantially unrestricted gravitational movement in a downward direction along the path of travel.

4,050,311

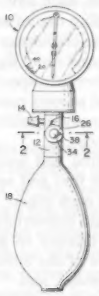
SPHYGMOMANOMETER

John Meredith Leach, Box 341, Port Jefferson, N.Y. 11777

Filed Jan. 21, 1976, Ser. No. 651,207

Int. Cl.[2] G01L *19/00*

U.S. Cl. 73—389 **10 Claims**



1. A rigidly structured, functionally stable, manually hand held measuring instrument comprising a manifold, a gauge directly and rigidly mounted on and functionally connected to said manifold, a squeeze bulb also directly and rigidly mounted on and functionally connected to said manifold, and a short stroke, quick action press type air escape valve also directly and rigidly mounted on and functionally connected to said manifold at a position where it can be freely operated to permit air escape or stop air escape instantly at the will of the operator by a very slight up or down but no extending, contracting nor sidewise movement of the operator's thumb on one hand(either right or left) alone so as to leave the other four fingers of the same hand free to securely and motionlessly support the instrument by said bulb and at the same time also squeeze or release the bulb while the operating hand and the thumb and all four fingers thereon are in a completely natural position so that no movement of the instrument in any direction is caused thereby, and also the said gauge is in a perfect and natural, unobstructed viewing position by said operator whose other hand is left entirely free constantly throughout a measuring operation.

4,050,312

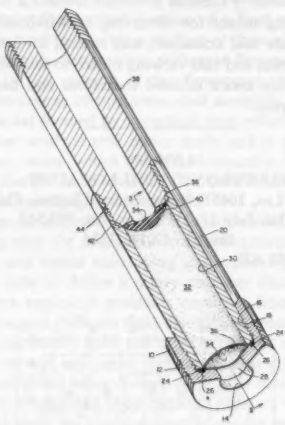
GAUGE PROTECTOR SEAL

Alma Lillian Myrick, Rte. 8, Box 67, Texarkana, Ark. 75501

Filed Mar. 19, 1976, Ser. No. 667,762

Int. Cl.[2] G01L *7/08, 7/16*

U.S. Cl. 73—395 **3 Claims**



1. Apparatus for transferring pressure from a flow line having a first fluid therein to a standby line having one end in communication with said flow line, said standby line having a closed column of a second fluid and a pressure indicating means therein, said apparatus comprising a flexible piston of elastomeric material mounted for limited axial movement in daid standby line when subjected to pressure, said piston being disposed between said flow line and said indicating means and having curved concave ends which terminate in thin pointed piston edges, said standby line comprising a sleeve having said piston mounted therein, and means for limiting the axial movement of said piston in said sleeve to a short distance, the normal diameter of said piston being slightly in excess of the inside diameter of said sleeve, and flexible means for sealing the junction between said flow line and said standby line, said sealing means being disposed between said flow line and said piston, whereby pressure in said flow line is transferred to said sealing means to effect limited movement of said piston and to subject said second fluid and said fluid indicating means to said pressure.

4,050,313

SEMICONDUCTOR PRESSURE TRANSDUCER

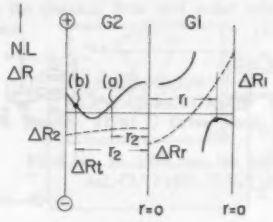
Satoshi Shimada; Kazuji Yamada; Yasumasa Matsuda, all of Hitachi; Ichiro Kimura, Mito; Michitaka Shimazoe, Hitachi, and Yukio Takahashi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed June 3, 1976, Ser. No. 692,368

Claims priority, application Japan, June 4, 1975, 50-66449; June 4, 1975, 50-66450

Int. Cl.² G01L 9/06

U.S. Cl. 73—398 AR 9 Claims



1. A semiconductor pressure transducer comprising a pressure-responsive circular diaphragm made of a single crystal of semiconductor material, a first strain gauge unit including at least one strain gauge element formed by injecting an impurity into a linear region extending on a surface of said diaphragm in parallel with a predetermined crystallographic axis and having a piezoresistance effect, a second strain gauge unit including at least one strain gauge element formed by injecting an impurity into a linear region extending on said surface of said diaphragm perpendicularly to said axis and having a piezoresistance effect, and means for fixing said diaphragm at the outer peripheral portion thereof, wherein the gauge elements of said first and second gauge units are disposed such that the numerical value representing the non-linearity of the stress-resistance change characteristic of the gauge elements of said first gauge unit is substantially equal in its absolute value to and opposite in sign to the numerical value representing the non-linearity of the stress-resistance change characteristic of the gauge elements of said second gauge unit.

4,050,314

PRESSURE GAUGE

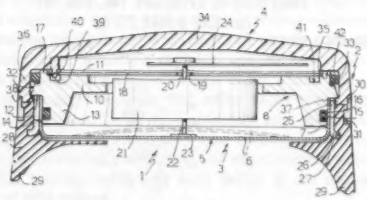
Francesco Longhetto, Turin, Italy, assignor to Semperit Anstalt, Schaan, Liechtenstein

Filed Mar. 31, 1976, Ser. No. 672,269

Claims priority, application Italy, Apr. 4, 1975, 67866/75

Int. Cl.² G01L 7/08

U.S. Cl. 73—406 8 Claims



1. Pressure gauge of the type comprising a cup-shaped case closed at the front by a cover consisting at least partly of transparent material; a dial provided on the front with a graduated scale and disposed in the case so as to be visible through the cover; measuring means disposed in the case to measure the pressure of the external environment; a pointer mobile along the graduated scale under the control of the measuring means; the cover being mounted rotatably on the case in an axially fixed position with respect thereto, and seal means being interposed between the cover and case; said seal means being disposed in such a manner as to be directly influenced by the pressure to be measured, and being elastically deformable by the effect thereof to angularly lock the cover relative to the case when said pressure exceeds a determined value.

4,050,315

REMOTELY ACTUATED SAMPLING APPARATUS

Reinhold S. Markfelt, Minneapolis, Minn., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 6, 1976, Ser. No. 748,257

Int. Cl.² G01N 1/12

U.S. Cl. 73—425.4 R 7 Claims

1. A sampling device for taking a sample of liquid at any desired level in a well and sealing the sample against possible contamination by liquid at a higher level as the device is withdrawn; said device having an average density greater than the liquid and including an integral sample receiving chamber portion intermediate its ends which is closed at the lower end of said chamber portion and has an opening at the top of said chamber portion which may be selectively closed; said opening being formed in a ring-like portion which includes upper and lower valve seat portions; a ball having a density lower than said liquid positioned in said chamber and adapted to be lifted by liquid entering said opening until said ball rests on said lower valve seat portion; an upper valve member mounted on an upwardly extending rod member for movement into or out of engagement with said upper valve seat portion; said rod member having first detent means thereon engageable with second detent means in an upper housing portion of said device to normally selectively lock said rod with said upper valve member in its position of engagement with said upper valve seat portion; and cable means extending upwardly from said rod for lowering or raising said device, said cable means being sufficiently strong as to resist breakage when a snapping force is applied thereto to cause said first and second detent means to become disengaged.

4,050,316

PIPETTE ASPIRATOR DEVICE

Edward J. Rapoza, Butler, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Nov. 3, 1975, Ser. No. 628,078

Int. Cl.² B01L 3/02

U.S. Cl. 73—425.6 12 Claims

1. An aspirator device comprising:

a hollow elongated body member terminating in a tip portion at one end and being open at both ends;

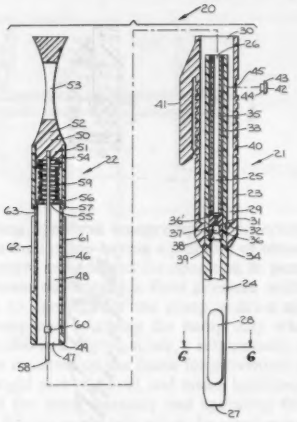
a hollow plunger and pin guide open at both ends and extending rearwardly from the tip portion concentrically within the body portion;

a plunger rod and pin assembly reciprocally mounted in the body and having a handle portion thereon;

the guide cooperating with the body to control the direction of travel of the plunger rod and pin assembly;

stop means limiting the amount of axial movement of the plunger rod and pin assembly;

pipette receiving means in the body adjacent the tip so that when a pipette is placed in the tip through the open end thereof it can be extended until it is gripped by the pipette receiving means and held in position for use;



the plunger being movable away from the tip until stopped so that withdrawal thereof will aspirate a predetermined amount of fluid into the pipette from a fluid source and being movable thereafter toward the reduced tip until stopped thereby projecting the fluid from the pipette; and

the pin having a piston mounted intermediate its ends for slidably sealing engagement with the walls of the guide with the guide having sufficient resilience and flexibility to permit reciprocal movement of the pin and piston therein with the piston slightly deforming the walls of the guide as it passes therethrough to facilitate the sealing interengagement therewith thereby reducing the need for strict coaxial alignment of the piston and the hollow guide.

4,050,317

CENTRIFUGAL WEIGHTS ORIENTING SYSTEM

Arthur V. Brandt, 88 Atlantic Place, Hauppauge, N.Y. 11787

Continuation-in-part of Ser. No. 436,748, Jan. 25, 1974, abandoned, and a continuation-in-part of Ser. No. 486,183, July 5, 1974, abandoned. This application Oct. 1, 1974, Ser. No. 511,047

Int. Cl.[2] F16H *33/02*

U.S. Cl. 74—64 **5 Claims**

1. A centrifuging weights orienting system comprising:

a rotor mounted about a first axis for rotation at a fixed angular velocity;

first driving means for driving the rotor to rotate about the first axis;

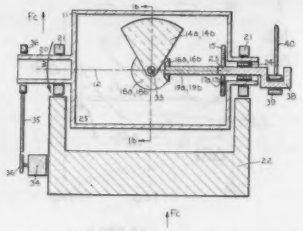
two centrifuging weights rotatably mounted about a common, second axis which is anchored at its ends to the rotor and intersects at right angles to the first axis;

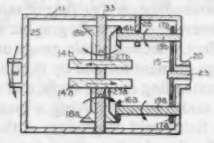
second driving means for driving the two centrifuging weights into oppositely directed rotations about the second axis at substantially the same fixed, angular velocity;

control means actuated by the rotation of the rotor at activate the second driving means for achieving the oppositely directed rotations;

said second driving means including a set of two driven gears each fixedly attached to one of the centrifuging weights, and also including means for synchronizing the oppositely directed rotations so that at periodic, predetermined time intervals the centrifuging weights are oriented in a common and fixed, prespecified spatial direction;

said control means comprising a common driving mechanism mechanically coupled to the driven gears for simultaneously driving these gears and the two attached centri-





fuging weights thereby achieving the oppositely directed rotations;

said common driving mechanism comprising a stationary anchor shaft inside the rotor and an anchor gear attached onto the anchor shaft which has an axis of rotation substantially coinciding with the first axis;

said anchor shaft being adjustable in rotational angular position to thereby define the common and fixed, spatial direction toward which the two centrifuging weights are periodically oriented; and

means for adjusting the angular position in a predetermined manner.

4,050,318

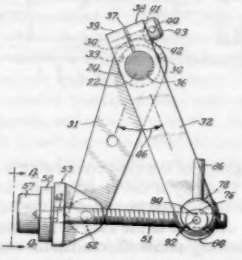
SIDEREAL RATE DRIVE MECHANISM FOR A TELESCOPE MOUNT

Kenneth J. Wolf, 3727 W. Wilson, Chicago, Ill. 60645

Filed May 8, 1975, Ser. No. 575,787

Int. Cl.[2] F16H *27/02*

U.S. Cl. 74—89.15 **7 Claims**



1. A drive mechanism for a telescope mount, the mount including a polar axis member and a polar support member,

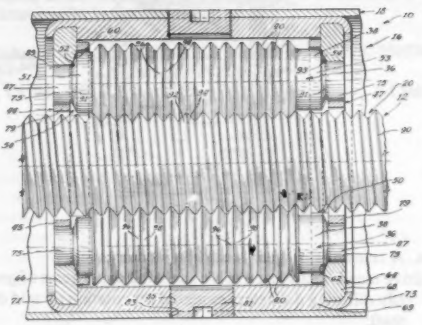
said axis member being rotatably supported by said support member, said drive mechanism comprising a first elongated arm adapted to have one end portion thereof secured to said axis member, a second elongated arm adapted to have one end portion thereof secured to said support member, said first and second arms extending outwardly in different directions from said polar and support members and forming an angle therebetween, and drive means interconnecting the outer end portions of said first and second arms for moving said outer end portions relative to each other and thereby changing said angle at about the sidereal rate, and further including adjustment means connected to one of said arms and to said drive means for changing the distance from said polar axis member to said drive means.

4,050,319

LINEAR ACTUATOR

Richard B. Stanley, 17763 G Drive North, Marshall, Mich. 49068

Filed Jan. 16, 1976, Ser. No. 649,693
Int. Cl.[2] F16H *27/02*
U.S. Cl. 74—89.15 **10 Claims**



1. In a linear actuator including a threaded shaft member, a bearing unit mounting member having a portion of same disposed in substantial concentric relation to the shaft member, a bearing unit operatively interposed between said mounting member and said shaft member for moving one of said members linearly and axially of said shaft member when the other member is rotated about the longitudinal axis of the shaft member, and means for rotating said other member about said axis of said shaft member, with said bearing unit comprising a plurality of discrete rollers each defining a force transmitting surfacing about each end of same and a plurality of thrust transmitting faces intermediate said bearing surfacings of the respective rollers that are angled relative to the longitudinal axis of the respective rollers and that are in rolling substantially complementing engagement with the shaft member threading, and an outer race structure defining spaced apart raceway surfacings about the shaft member axis about which said roller bearing surfacings ride, with said roller faces being free of engagement with said outer race structure and the mounting member and said rollers being in free rolling nonjournalled relation to said outer race structure, the improvement wherein:

said roller bearing surfacings each define at the respective ends of said rollers:

a radial load transmitting bearing surface and a thrust transmitting bearing surface intermediate said radial load transmitting surface and said faces at the respective ends of the respective rollers,

said outer race structure raceway surfacings each defining a radial load transmitting surface on which the respective roller radial load transmitting bearing surfaces respectively ride and a thrust transmitting surface on which the respective roller thrust transmitting bearing surfaces respectively ride in substantial complemental relation thereto,

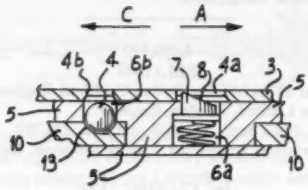
said roller thrust transmitting bearing surfaces at either end of the respective rollers being substantially equally angled relative to the longitudinal axis of the respective rollers and at an angulation up to ninety degrees that exceeds said roller thrust transmitting face angulation.

4,050,320

TRANSMISSION MECHANISMS

Frederick James Hawksworth, Crewe, England, assignor to Rolls-Royce Motors Limited, Crewe, England

Filed Feb. 13, 1975, Ser. No. 549,748
Claims priority, application United Kingdom, Feb. 20, 1974, 7654/74
Int. Cl.[2] F16H *27/00*
U.S. Cl. 74—112 **6 Claims**



1. A transmission mechanism comprising a reversible motor, a driving member rotatably driven from the motor, a rotor member non-rotatable with respect to and eccentrically mounted on the driving member and arranged to rotate therewith, a further member eccentrically mounted with respect to and selectively rotatable with respect to the rotor member, and output member operatively supported by and selectively rotatable relative to said further member, a first means, automatically operable when said motor is driving in a reverse direction of rotation and said output member is in one position, to provide a positive mechanical connection between the rotor member and the further member, said first means being biased to its operative position, and a second means automatically operable, when said motor is driving in a forward direction of rotation and said output member is in another position, to provide a positive mechanical connection between the further member and the output member, said second means being also employed firstly, when the direction of rotation of the motor is changed from reverse to forward rotation, so as to enable the rotor member to carry the further member to its correct position for the second means of positive mechanical connection to take place, and secondly, when the direction of the motor is changed from forward to reverse rotation, so as to hold the further member to the output member until such time as the rotor member is moved to the position where it can be engaged by the first means of positive mechanical connection.

4,050,321

MULTI V-GROOVED PULLEY STRUCTURE AND METHOD OF MAKING SAME

Derald H. Kraft, Canton, Ohio, assignor to Aspro, Inc., Canton, Ohio

Filed Mar. 15, 1976, Ser. No. 666,931
Int. Cl.[2] F16H *55/44*; B21D *53/26*
U.S. Cl. 74—230.8 **18 Claims**

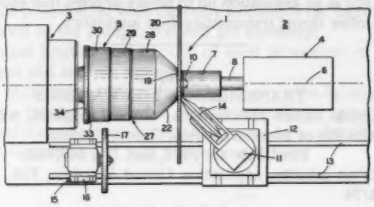
1. A one-piece, sheet metal multi V-grooved pulley structure including:

a. a circular hub wall;

b. an annular flange wall connected with the hub wall and

extending generally axially from the hub wall and terminating in an open end opposite the hub wall;

c. a series of outwardly opening V-shaped grooves formed in the annular flange wall, said grooves each being defined by a pair of inwardly angled side walls;



d. and each of the pairs of angled side walls increasing in metal thickness from the open end toward the hub wall of the annular flange wall.

4,050,322

BELTING

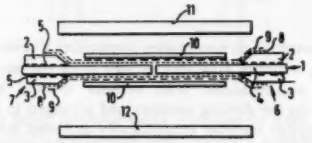
Peter Lothar Ernst Möring, Sutton Coldfield, England, assignor to Dunlop Limited, London, England

Filed Sept. 27, 1976, Ser. No. 726,782

Claims priority, application United Kingdom, Oct. 3, 1975, 40500/75

Int. Cl.² F16G *1/00*

U.S. Cl. 74—231 J **22 Claims**



1. Belting having a layer of covering material and a compression resistant longitudinal reinforcement structure as hereinbefore defined, the belting being formed with a joint region at which ends of the reinforcement structure are in end-to-end relationship with a layer of jointing fabric as hereinbefore defined overlying the ends of the reinforcement structure and positioned with warp members of the jointing fabric lying parallel to the length of the belting.

4,050,323

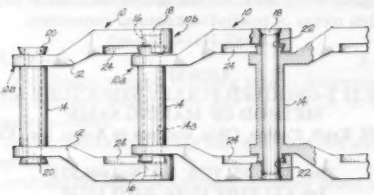
PINTLE-TYPE INDUSTRIAL CONVEYOR CHAIN

Thomas I'Anson, 4014 Hunts Point Road, Bellevue, Wash. 98004

Filed Jan. 12, 1976, Ser. No. 648,457

Int. Cl.² F16G *15/12*; B65G *17/40*

U.S. Cl. 74—251 C **5 Claims**



1. A chain for industrial conveyors and the like comprising a succession of links pivotally interconnected including a first link and an adjoining second link having mutually adjacent ends each with transversely opposite side portions overlappingly confronting and pivotally joined to the respective side portions of the other by sets of pivotally engaged connecting elements formed integrally with the respective link side portions, said sets of connecting elements each comprising a stub journal porjecting transversely from one such side portion and a socket bearing, conformed to and pivotally receiving said stub jorunal, said projecting stub journals being of conically divergent form and the socket bearings being of complemental conically convergent form.

4,050,324

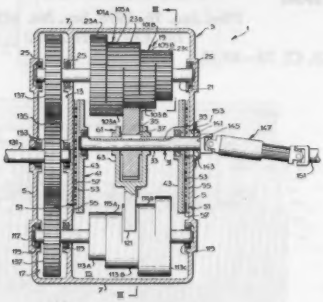
TRANSMISSION GEAR MECHANISM

Gaston Teyssandier, 1645 Maisonneuve Blvd., Apt. 2110, Montreal, Quebec, Canada (H3H 2N3)

Filed Oct. 12, 1976, Ser. No. 731,508

Int. Cl.² F16H *35/06, 35/02, 55/04*

U.S. Cl. 74—397 **8 Claims**



1. A transmission gear mechanism comprising:

drive means including a drive shaft and drive gears of gradually differing diameters mounted for rotation on said drive shaft;

driven means including a driven shaft, parallel to and movable toward and away from said drive shaft, and a driven gear mounted on said driven shaft to be movable axially therealong and to be kept in mesh with said drive gears, selectively;

means for so moving said driven gear along said drive shaft to shift it from one drive gear to the next, wherein said drive means comprises transfer means to assist the driven gear in moving from one drive gear to the next during said shifting; and

means to hold the driven gear in mesh with the drive means at all times.

4,050,325

SPEED CHANGE GEAR APPARATUS FOR AN AUTOMOBILE TRANSMISSION

Yoshio Shishido, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyoto, Japan

Filed Feb. 24, 1976, Ser. No. 661,016

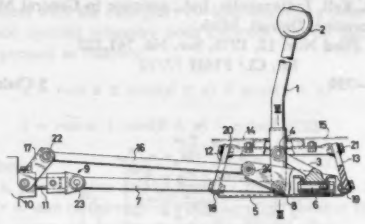
Claims priority, application Japan, May 30, 1975, 50-65559

Int. Cl.² G05G *1/04, 7/00*

U.S. Cl. 74—473 R **45 Claims**

1. A speed change gear apparatus for an automobile transmission including a shift lever having its one end pivotally connected with one end of a control rod, the other end of which is connected with one end of a control shaft extending from a transmission through a joint; the apparatus comprising a pair of support members of an oscillation isolating material, one end of the support members being connected with a car body while their other ends carry a shift lever housing which supports the shift lever in suspension in a pivotal manner, and

a support rod disposed substantially in parallel relationship with the control rod, the support rod having its opposite ends



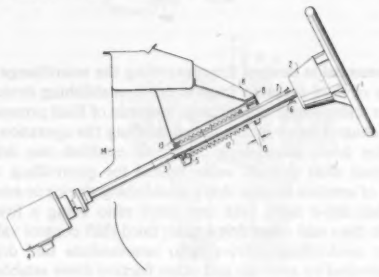
pivotally connected with the shift lever housing and the transmission, respectively.

4,050,326

SAFETY STEERING COLUMN FOR PASSENGER MOTOR VEHICLES

Wolfgang Köpf, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Feb. 9, 1976, Ser. No. 656,524
Claims priority, application Germany, Feb. 8, 1975, 2505340
Int. Cl.² B62D *1/18*
U.S. Cl. 74—492 **5 Claims**



1. A safety steering column assembly for a vehicle comprising in combination

steering shaft means for connecting a steering wheel with a steering gear mechanism, said steering shaft means being axially collapsible,

deformation means surrounding at least a portion of said steering shaft means for absorbing axial impact forces on said steering shaft means, said deformation means including an undulated tubular member having different axial rigidity values along different axial sectional portions of said undulated tubular member,

guide means including a second tubular member interposed betwen said steering shaft means and said undulated tubular member for guiding said undulated tubular member only in the axial direction, said second tubular member having a greater axial extent than said undulated tubular member, wherein said second tubular member is axially movable upon impact against said steering wheel,

support means for maintaining a first end of said undulated tubular member whch is remote from said steering wheel at a distance from an end wall of the vehicle, and

bracket means for releasably securing said second tubular member to a fixed vehicle part at a position between the steering wheel and a second end of said undulated tubular member which faces said steering wheel, said bracket means being rigidly secured to said second tubular member at a predetermined axial distance from said second end of said undulated tubular member such as to be carried by said second tubular member against said second end of said undulated tubular member upon axial movement of said second tubular member occurring by said impact against said steering wheel,

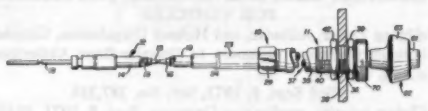
wherein said predetermined axial distance delays deformation of said undulated tubular member such that initial impact force peak is reduced.

4,050,327

FAST-MAKE CONNECTION FOR A PUSH-PULL CONTROL CABLE ASSEMBLY

Robert J. Thomas, Kent, and Marvin H. Jones, Ravenna, both of Ohio, assignors to Samuel Moore and Company, Mantua, Ohio

Filed Mar. 21, 1975, Ser. No. 560,582
Int. Cl.² F16C *1/12, 1/14, 1/16*
U.S. Cl. 74—502 **5 Claims**



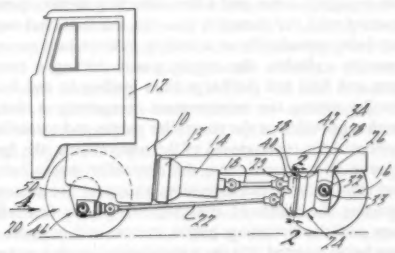
1. A connector for operatively securing a push-pull cable assembly having a core reciprocably slidable in a casing to a control device having at least a sheath member and a plunger means movable longitudinally in the sheath member, a connector housing secured to the push-pull cable casing, means releasably securing said connector housing to the sheath member, a shuttle plug fixedly secured to the push-pull cable core and reciprocably slidable within said connector housing and the sheath member releasably secured thereto, lug means presented from the plunger means, and means in the shuttle plug releasably to engage said lug means and permit relative rotation therebetween.

4,050,328

FOUR-WHEEL DRIVE VEHICLE WITH DRIVE TRANSFER GEAR ASSEMBLY

Rowland C. Romick, Mount Clemens, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 296,360, Oct. 10, 1972, Pat. No. 3,901,092.
This application May 22, 1975, Ser. No. 580,113
Int. Cl.² F16H *1/44*
U.S. Cl. 74—711 **15 Claims**



1. In a motor vehicle of the type including a prime mover, front and rear drive axles; drive means interconnecting said prime mover and said front and rear axles and including a drive transfer assembly comprising:

A. an input shaft drivingly connected to said prime mover;

B. a first output shaft drivingly connected to said rear axle;

C. a second output shaft rotatable relative to said first output shaft and drivingly connected to said front axle;

D. means operative in response to relative rotation between

said output shafts in one directional mode to preclude such relative rotation; and

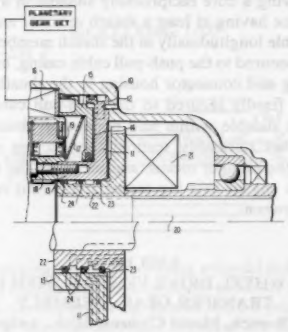
E. means drivingly interconnecting said shafts and operative to apportion the torque received by said input shaft between said first output shaft and said second output shaft and including means operative during operation of said rotation precluding means to limit the magnitude of the torque transmitted to one of said output shafts from said input shaft.

4,050,329

PLANETARY GEAR CHANGE-SPEED TRANSMISSION FOR VEHICLES

Wolfgang Zaiser, Althutte, and Helmut Diegelmann, Grunbach, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Sept. 8, 1972, Ser. No. 287,218
Claims priority, application Germany, Sept. 9, 1971, 2145107
Int. Cl.[2] F16H *3/44*
U.S. Cl. 74—750 R **10 Claims**



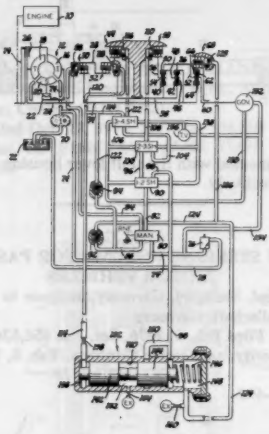
1. A planetary gear change-speed transmission for vehicles, which includes input and output means, transmission housing means including a fixed annular surface means, a planetary gear set operatively connected with the output means, a frictional engaging means and a free-wheeling means operatively connected with the planetary gear set, the frictional engaging means being actuable by an actuating piston means arranged in an annular cylinder, the output means driving a controller means, and feed and discharge lines leading to and from the controller means, the improvement comprising: a sleeve-like extension provided at the controller means and extending in a direction of the input means of the transmission, the feed and discharge lines to and from the controller means being disposed in said sleeve-like extension, a support flange means for supporting the frictional engaging means, the free-wheeling means and the actuating piston means, said support flange means being inserted into the transmission housing means from the input side thereof, said support flange means having an annular portion secured to a fixed annular surface of the transmission housing means and a sleeve portion at an inner circumference of the annular portion facing the input means of the transmission, said sleeve portion surrounding said sleeve-like extension and engaging at least portions thereof, said sleeve portion being provided at its inner circumference with transfer means for transferring the pressure medium to and from the feed and discharge lines leading to and from the controller means.

4,050,330

TRANSMISSION CONTROL WITH GOVERNOR DISCONTINUANCE CONTROL VALVE

Nathaniel B. Kell, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 12, 1976, Ser. No. 741,222
Int. Cl.[2] F16H *57/10*
U.S. Cl. 74—759 **5 Claims**



1. A transmission control for controlling the interchange of a plurality of fluid actuated friction drive establishing devices in a power transmission comprising: a source of fluid pressure; first shift control valve means for controlling the operation of one friction drive establishing device to establish one drive ratio; second shift control valve means for controlling the operation of another friction drive establishing device to establish another drive ratio, said one drive ratio being a lower speed ratio than said other drive ratio; third shift control valve means for controlling a drive ratio intermediate said drive ratios controlled by said one and other friction drive establishing devices; governor means in fluid communication with said source and said first, second and third shift control valve means and being operable to generate a fluid pressure proportional to vehicle speed which pressure is operable on said shift control valve means to control operation thereof; and control valve means disposed in series flow relation between said first shift control valve means and said one friction drive establishing device, and in parallel flow relation with said second shift control valve means and said other friction drive establishing device, said control valve means having an actuated position for preventing fluid flow to said one friction drive establishing device and an unactuated position for permitting fluid flow to said one friction drive establishing device, said control valve means being moved to said actuated position when fluid pressure is directed to said other friction drive establishing device and being maintained in said actuated position to prevent an interchange from said other ratio to said one ratio if the pressure of said governor means decreases sufficiently rapidly to permit immediate operable interchange of said first and second shift control valve means.

4,050,331

CYCLOIDAL GEARS

Rudolf Braren, Kienaderweg 17, 8061 Gunding, Germany

Filed July 14, 1975, Ser. No. 595,729
Claims priority, application Germany, July 12, 1974, 2433675
Int. Cl.[2] F16H *1/28*
U.S. Cl. 74—804 **18 Claims**

1. A planetary gear comprising at least one planet wheel moved with the aid of an eccentric and at least one concentric

wheel, said wheels engaging by means of a closed cam plate cycloid constructed on one wheel and a ring of rollers constructed on the other wheel, and the tangency points of the rollers with the cam plate cycloid describing points of a reference cycloid whereby both cycloids can be mathematically expressed as follows:

$$x = r\cdot\cos\alpha \pm e\cdot\cos(\beta \pm \alpha) \mp q\cdot\cos(\gamma \pm \alpha)$$

$$y = r\cdot\sin\alpha + e\cdot\sin(\beta \pm \alpha) - q\cdot\sin(\gamma \pm \alpha)$$

where:

x, y = abscissa and ordinate of the plane of said cycloids;
r = sum of the radii of a circle rolling without sliding on the outer circumference of a fixed base circle;
α = angle subtended between said abscissa and a line passing through the center of said cycloids, through a point of tangency of said rolling circle and fixed base circle, and through the center of said rolling circle;
e = eccentricity of the gear arrangement;
β = rolling angle;
q = equidistant spacing;
γ = transmission angle;

and wherein the value of the parameter q for the cam plate cycloid is larger than for the reference cycloid, and the value of the parameter r in the case of the construction of the cam

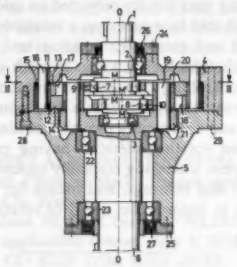


plate cycloid as an epicycloid is larger, and in the case of the construction of the cam plate cycloid as a hypocycloid is smaller than for the reference cycloid.

18. A planetary gear arrangement comprising: at least one planet wheel, eccentric means for moving said planet wheel, at least one further wheel concentrically mounted with respect to said planet wheel, means for engaging said at least one planet wheel including a closed cycloid cam means provided on one of said planet wheel and said further wheel and roller means provided on the other of said planet wheel and said further wheel, said roller means and said cam engaging at contact points describing points of reference cycloid, wherein distance values $\Delta\mu$ occurring between said roller means and said contact points on said cam means and the reference cycloid, respectively, are defined as follows:

$$\Delta\mu = (\Delta q - \Delta r \cdot \cos\gamma/\sin\gamma),$$

where:

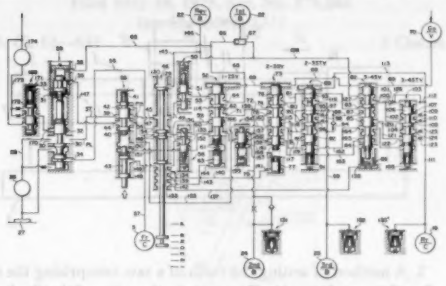
Δq = difference of values of an equidistant spacing of the cam means and reference cycloid,
Δr = difference of values of the sum of the radii of a circle rolling without sliding on the outer circumference of a fixed base circle respectively defining the cam means and the reference cycloid, and
γ = the transmission angle.

4,050,332

OIL PRESSURE CONTROL SYSTEM FOR AN AUTOMATIC TRANSMISSION SYSTEM

Yutaka Taga, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Oct. 7, 1975, Ser. No. 620,344
Claims priority, application Japan, Dec. 23, 1974, 49-147900
Int. Cl.[2] B60K *41/08*
U.S. Cl. 74—869 **13 Claims**



1. An oil pressure control system for an automatic transmission system which includes a fluid torque converter, a transmission gear and friction engaging means for establishing a selected transmission engagement in said transmission gear, comprising:

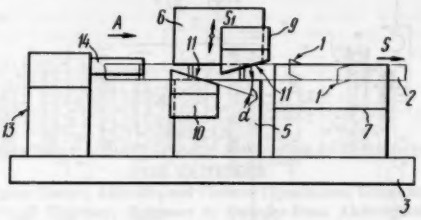
a source of oil pressure;
a line pressure regulating valve which generates a line pressure from the oil pressure of said source, said line pressure being regulated to be suitable for operating said friction engaging means;
a throttle pressure regulating valve which generates a throttle pressure from said line pressure, said throttle pressure increasing as the engine torque increases;
a governor pressure regulating valve which generates a governor pressure from said line pressure, said governor pressure increasing as the vehicle speed increases;
a plurality of speed shift valves which are shifted according to said governor pressure and said throttle pressure so as to change over the supply of oil pressure to said friction engaging means for shifting transmission between lower and higher speed stages;
a manual shift valve which is shifted by hand among a plurality of ranges for effecting a selected transmission; and
a speed shift timing valve which is related to upper and lower speed shift valves and is shifted for variably restricting supply and exhaust of oil to and from upper and lower speed stage friction engaging means which are alternately actuated according to the shifting of said speed shift valves in the manner such that in the upshifting process the rate of supplying oil to said upper shift stage friction engaging means is gradually decelerated while the rate of exhausting oil from said lower speed stage friction engaging means is gradually accelerated, said speed shift timing valve comprising a valve element, first and second port means adapted to be controlled by said valve element, said first port means providing a middle portion of a passage means for supplying oil to said upper speed stage friction engaging means while said second port means providing a middle portion of a passage means for supplying oil to said lower speed stage friction engaging means, and a third port means connected with said passage means for supplying oil to said upper speed stage friction engaging means, wherein the pressure applied to said third port drives said valve element towards a shift position where said valve element applies more restriction to said first port means and applies less restriction to said second port means.

4,050,333

METHOD OF SETTING SAW TEETH AND DEVICE FOR REALIZATION THEREOF

Vladimir Viktorovich Idel, ulitsa Gertsena, 3, kv. 37, Zavolzhie Gorkovskoi oblasti, U.S.S.R.

Filed Mar. 5, 1975, Ser. No. 555,611
Claims priority, application U.S.S.R., Mar. 12, 1974, 2006502; Mar. 12, 1974, 2006504
Int. Cl.[2] B23D *63/00*
U.S. Cl. 76—112 2 Claims



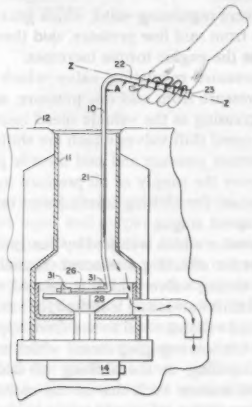
1. A method of setting the teeth of a saw comprising the step of applying a dynamic effect to only the edge of the flank of a free positioned saw tooth, at a predetermined distance from the point of said tooth for bending and twisting of the latter.

4,050,334

ZEE WRENCH

Robert Davis, Jr., Nashville, Tenn., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed May 12, 1976, Ser. No. 685,711
Int. Cl.[2] B25B *13/48*
U.S. Cl. 81—119 1 Claim



1. A tool for use in freeing the rotor of a garbage disposal unit installed in the drain of an attached sink comprising

a shaft member joined at a first end to a handle section and at a second end to a jaw section,

said jaw section of a size to fit within a drain pipe and to fit against upraised detents on the rotor of a garbage disposal unit installed in said drain pipe,

said jaw section oriented to extend in a straight line and in a radial perpendicular direction to the axis of the shaft section, and at a perpendicular angle to the shaft axis,

said handle section bent to extend in a radial direction and at an acute angle to the shaft section so as to extend from the shaft section towards the jaw section,

said shaft section of a length to extend from the surface of the rotor to beyond the drain opening of the drain pipe, in which

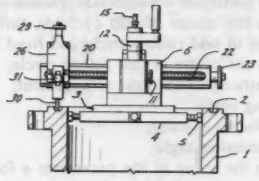
the jaw section is joined to the shaft section by a length of bar which extends away from the axis of the shaft section so that the attached jaw section intersects the axis of the shaft section.

4,050,335

PORTABLE GROOVING TOOL

Guy T. Gilmore, Crosby, Tex., assignor to Multi-Fab, Inc., Houston, Tex.

Filed Mar. 10, 1976, Ser. No. 665,859
Int. Cl.[2] B23B *5/16*
U.S. Cl. 82—4 C 1 Claim



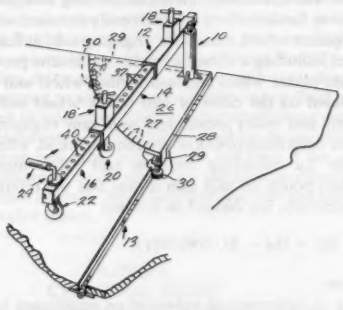
1. A portable grooving tool having means for mounting same in a tubular work piece, a base member fixedly centered in said work piece, a shaft mounted vertically in said base member, a ring gear fixedly mounted on said base member and coaxially with said base member, a rotatable member mounted on said shaft and means for rotating said rotatable member around said shaft including a gear in mesh with said ring gear, means for controlling the speed of rotation of said rotating member, a transversely adjustable arm mounted on said rotating member and a vertically movable cutting tool mounted on said arm, said rotating member having coaxial, antifriction bearings therein, a bushing coaxially mounted in said housing and between said bearings, and means for placing a drag on said bushing to control the speed of rotation of the rotating member.

4,050,336

INSULATION CUTTER

James H. Stubbings, Rockville, Md., assignor to Potomac Applied Mechanics, Inc., Bethesda, Md.

Filed Mar. 5, 1976, Ser. No. 664,173
Int. Cl.[2] B23D *19/00*; B26D *1/18*
U.S. Cl. 83—486.1 7 Claims



1. Apparatus for cutting insulation sheet material or the like, comprising:

a pivot post,

a first trammel tube,

a second trammel tube,

means for mounting said first trammel tube for radial movement with respect to said pivot post,

means for retaining said first trammel tube in any one of a plurality of radial positions with respect to said pivot post,

means for mounting said second trammel tube for radial telescoping movement with respect to said first trammel tube,

means for maintaining said second trammel tube in any one of a plurality of telescopic positions with respect to said first trammel tube,

a first cutter wheel mounted on said first trammel tube on a portion thereof remote from said pivot post,

a second cutter wheel mounted on said second trammel tube on a portion thereof remote from said first trammel tube, and

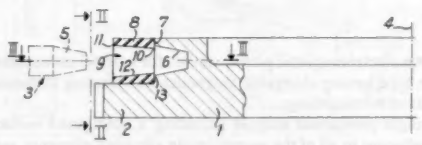
means for mounting said second cutter wheel so that it is movable from a first position wherein it is latched in line with said first and second trammel tubes and may make cuts in insulation sheet material or the like extending radially from said pivot post, to a second position wherein it is disposed at 90° with respect to said first position and may make cuts in insulation sheet material or the like that are arcuate, said means for mounting said second cutter wheel including a rod member associated with said second trammel tube, a handle extending upwardly from the top portion of said rod member, and cooperating detent means operatively associated with said rod member and said second trammel tube for providing latching of said second cutter wheel in either said first or said second position thereof, and means providing for vertical movement of said second cutter wheel with respect to said second trammel tube so that said second cutter wheel may be lifted generally out of contact with insulation sheet material or the like to be cut during movement of said cutter wheel from the first position thereof to the second position thereof.

4,050,337

TURRET ALIGNMENT SYSTEM

Pierre M. Allemand, Cires-les-Mello, France, assignor to S.A. Beauplat Fils & Cie, France

Filed June 30, 1976, Ser. No. 701,103
Claims priority, application France, July 9, 1975, 75.21586
Int. Cl.² B26F *1/04*; B23B *29/32*
U.S. Cl. 83—552 **6 Claims**



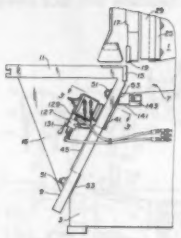
1. In a capstan tool holder for a punching machine comprising two chucks spaced apart for the passage of sheets to be machined, one chuck being equipped with punches and the other chuck being equipped with dies, a selection device for selecting the position of the chucks, each chuck being connected to a rotary drive mechanism that selectively disengages the drive mechanism under control from the selection device, an indexing device controlled by the selection device and having a displaceable pin on a fixed portion of the machine to penetrate a selected bore on the periphery of the chuck the improvement comprising the provision of: shock absorber means made from a relatively elastic material on the periphery of the chuck about each bore for absorbing shocks when the pin penetrates the bore to stop the chuck, the shock absorber means comprising an orifice aligned with the bore, the cross-section of the orifice at the end adjacent the bore being substantially the same as the cross-section of the bore adjacent the orifice, the outside of the orifice having a cross-section which, at least in the direction of rotation of the chuck is larger than the cross-section of the pin, and wherein each orifice has a sloping wall which converges toward the central area of the chuck.

4,050,338

POWER KNIFE ADJUSTMENT FOR A SHEAR MACHINE

Eugene Walford Pearson, Orinda, Calif., assignor to Canron, Inc.

Filed May 19, 1975, Ser. No. 578,886
Int. Cl.² B26D *5/12*
U.S. Cl. 83—641 **5 Claims**



4. In a machine embodying a horizontal fixed element of substantial length, a movable element cooperating therewith to perform a change on a piece of work, a pair of mounting walls extending to the front of said machine and terminating in sloping front edges, each edge including an upstanding lug, a front wall carrying said fixed element, said front wall spanning said mounting walls and having end slots receiving said lugs, said end slots being longer than said lugs to permit of limited sliding movement of said front wall on the sloping edges of said mounting walls; a power operated wedge assembly at each end of said front wall and adjustably spacing the upper edge of each slot from the proximate lug to slidably adjust said front wall and fixed element carried thereby, along the proximate mounting wall whereby to alter the horizontal spacing between said fixed and movable elements, each said power operated wedge assembly extending in a frontal direction through one of said end slots, between the upper edge of said slot and the proximate lug and comprising power drive means including a piston rod, a cylinder slidably mounted about said piston rod, a piston within said cylinder and fixedly secured to said piston rod, a fluid passageway into said cylinder and terminating toward one end thereof, a second fluid passageway into said cylinder and terminating toward the other end thereof, whereby to provide for two-way hydraulic control of said power drive means; a wedge; means coupling said wedge to said cylinder; a pump; a hydraulic line to each of said fluid passages from said pump, and a reversing valve in said lines.

4,050,339

AUTOMATIC CAROUSEL-TYPE MEAT CUTTING MACHINE

Richard A. Soleri, 5614 N. Rock Creek Road, Agoura, Calif. 91301

Filed Jan. 7, 1976, Ser. No. 647,320
Int. Cl.² B26D *4/50*
U.S. Cl. 83—703 **5 Claims**

1. An automatic carousel-type meat cutting machine comprising:

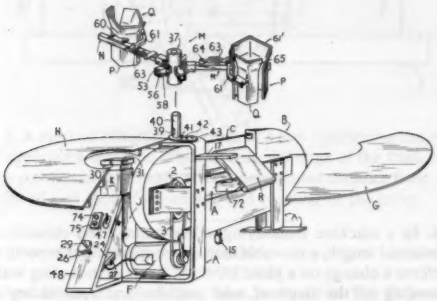
a. a rotatable carousel having a central vertical drive shaft with a hub keyed to said shaft and a plurality of radially extending arms projecting from said hub and lying in a horizontal plane;

b. a pair of meat engaging jaws carried by each arm, one of the jaws in each pair being spring-biased, each pair of jaws adapted to receive a bulk meat item therebetween;

c. a circular meat supporting horizontal surface made up of an arcuate-shaped stationary platform with radially extending ends and a vertically adjustable arcuate-shaped platform with radially extending ends disposed close to the adjacent ends of the stationary platform;

d. means for rotating said drive shaft and carousel for moving said arms and pairs of jaws in a circular path for causing the bulk meat items to move over said platforms in a circular path while being slidably supported by said platforms;

e. means for mounting an endless bandsaw so that it has one of its two longitudinal reaches lying in a horizontal plane substantially parallel with the plane of said stationary platform and adjacent to one of its radial ends so that the teeth on the bandsaw will face away from the edge of this radial end;



f. means for lowering said adjustable platform below said stationary platform to a distance equal to the thickness of the slices of meat desired to be cut from the bulk meat items;

g. said carousel hub having a plurality of outwardly projecting clevises extending radially from the hub axis, each clevis extending radially from the hub axis, each clevis having a base portion that extends beyond the clevis;

h. a socket pivotally connected to each clevis and overlying its associate base, said socket being U-shaped in cross section with the sides of the socket normally facing downwardly and resting on its base; and

i. each radially extending arm being removably received in said socket.

4,050,340

POWER TOOL TRACK

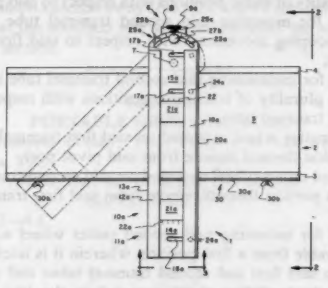
Robert D. Flanders, 28035 SW. Parkway, Wilsonville, Oreg. 97070

Division of Ser. No. 454,980, March 26, 1974, Pat. No. 3,983,776. This application July 25, 1975, Ser. No. 599,123

Int. Cl.[2] B27B *9/04*

U.S. Cl. 83—743 **10 Claims**

1. A power tool track system comprising a support substructure, means connected to said substructure for supporting a power tool above said substructure in a substantially horizontal plane with respect to the vertical axis of said substructure, said power tool track being adjustably mounted on said support means for angular movement in a horizontal plane with respect to the vertical axis of said substructure, and including longitudinally-extending base and adjustable frame members, respectively, which provide a support surface for carrying power tools thereon, the frame member having an outer edge forming a longitudinally-extending straight edge for maintaining the accuracy in use of said power tools and, attached to the frame member, a longitudinally-extending guide means, raised above the surface of said frame member, for maintaining a power tool in proper alignment for traversing a straight predetermined, longitudinal path, the distance from the guide means to the outer edge of said base member, the predetermined support surface on which said power tool will ride, being such that said power tool will be in close proximity with, and more



parallel to, said outer edge, and said frame member being laterally adjustable for providing a laterally-extending support surface capable of carrying a plurality of power tools.

4,050,341

ELECTROMAGNETIC PICKUP FOR STRINGED MUSICAL INSTRUMENTS

John F. Underwood, 530 S. Hampton, Orlando, Fla. 32803

Filed Feb. 11, 1976, Ser. No. 657,266

Int. Cl.[2] G10D *5/00*; G10H *3/08*

U.S. Cl. 84—1.15 **21 Claims**

1. An electromagnetic pickup device for musical instruments of the type having elongated magnetizable vibrating elements, said device comprising

a single permanent magnet including a configured surface adjacent to all of the magnetizable vibrating elements, said configured surface providing a variation of the magnetic field effecting respective ones of said elements in accordance with the magnetizability of said elements, and

a low impedance coil surrounding said permanent magnet.

4,050,342

MUSIC BOX TOY

Ikuo Suzuki, Urawa, and Shuji Nishiyama, Okaya, both of Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Japan

Filed July 2, 1976, Ser. No. 702,023

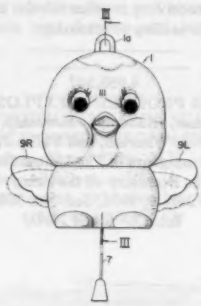
Claims priority, application Japan, July 5, 1975, 50-93363[U]

Int. Cl.[2] G10K *1/06*

U.S. Cl. 84—95 C **9 Claims**

1. In a music box toy of the type including a movable appendage which projects externally of the body of the toy and which is adapted to be moved by a drive source contained within the music box during the playing thereof, the improve-

ment comprising a drive unit for the appendage, and means for connecting the drive unit and the appendage, said connecting



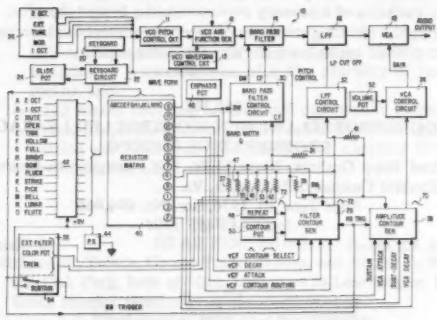
means being disengageable from the drive unit when the appendage is moved by an external force.

4,050,343

ELECTRONIC MUSIC SYNTHESIZER

Robert A. Moog, Williamsville, N.Y., assignor to Norlin Music Company, Lincolnwood, Ill.

Continuation of Ser. No. 396,323, Sept. 11, 1973, abandoned. This application Dec. 29, 1975, Ser. No. 644,864
Int. Cl.[2] G10H *1/00*
U.S. Cl. 84—1.01 **12 Claims**



1. An electronic music synthesizer, comprising:

a sound producing chain having a plurality of voltage-controlled elements;

a low impedance control input for each of said elements;

means coupled between each control input and its respective element for developing a control voltage proportional to the sum of the control currents supplies to the respective input;

means including a resistor matrix coupled to said control inputs for supplying predetermined control currents to said inputs to control the functions of said elements, wherein said matrix comprises a set of rows and a set of columns, means for coupling one of said sets to a source of constant voltage, and means coupling the other of said sets to said control inputs; and

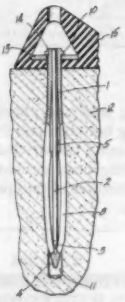
means coupled to said inputs for supplying pitch-related control currents to said control inputs in parallel with said resistor matrix.

4,050,344

EXPANSIBLE NAIL LIKE PLUG

Roger Dorgnon, St. Peray, France, assignor to Olin Corporation, New Haven, Conn.

Filed Mar. 26, 1976, Ser. No. 670,786
Claims priority, application France, Apr. 25, 1975, 75.13071
Int. Cl.[2] F16B *13/04, 15/04*
U.S. Cl. 85—68 **2 Claims**



1. An expansible nail-like plug comprising:

a. an elongated body having a pointed end which can penetrate and form a blind hole in a supporting material upon application of blows to an opposite end thereof, said body having an axial bore extending from said opposite end for approximately one-half of the length of said body, and said body having at least one radial slot extending laterally through said body to form adjacent, expandible portions of said body, said radial slot extending for approximately two-thirds of the length of said body from said bore toward said pointed end, and said slot terminating short of said pointed end whereby the latter is uninterrupted, and said slot having a width which is smaller than the diameter of said bore; and

b. an elongated expansion core having a pointed end and a cylindrical shank the diameter of which is sufficiently less than the diameter of said bore to permit ready insertion and removal of said core into and from said bore, said shank diameter being greater than the width of said slot and said core having a length which is greater than the length of said bore but less than the length of said elongated body, said core forming means for driving into said bore and slot operable to radially separate said body portions when said body is disposed in a blind hole in a supporting material to cause said body portions to grip the sides of the hole and cause said body to anchor in the blind hole.

4,050,345

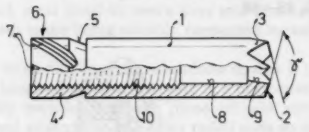
SELF DRILLING ANCHORING DOWEL

Wilbert Reibetanz, Leinfelden; Karl Wanner, Echterdingen, and Reinhard Hahner, Ostfildern, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Feb. 11, 1976, Ser. No. 657,106
Claims priority, application Germany, Feb. 28, 1975, 2508635
Int. Cl.[2] E04B *1/48;* F16B *13/06*
U.S. Cl. 85—68 **14 Claims**

1. A self drilling anchoring dowel adapted to drill, when rotated about its axis, a hole into a hard support structure and to remain anchored in said hole as a fixture for attachment to said structure of an object which is to be coupled thereto, said dowel comprising an elongated substantially cylindrical dowel body having a longitudinal axis and axially spaced front and rear ends; an annular drilling head at said front end, said drilling head being provided at its front end with an annular projecting collar having a plurality of peripherally distributed

substantially conical teeth having cutting edges, the cutting edges of each of adjacent pairs of said teeth including with one another an angle of between 120° and 160°, each adjacent pair of said conical teeth forming a root region, said cutting edges extending to said root region and thereat also including an angle of between 120° and 160° with one another; and means



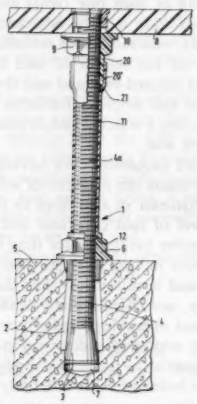
for removing drilling dust and chips, said means including a bore axially extending between said front end and said rear end of said dowel body and a constricted part located within the confines of said drilling head defining a port communicating with said bore, the diameter of said port being smaller than the diameter of said bore.

4,050,346

ANCHORING DEVICE FOR USE IN MASONRY AND LIKE STRUCTURES WITH CORROSION-PROTECTION FEATURE

Artur Fischer, Weinhalde 34, D-7244 Tumlingen, Waldachtal 3, Germany

Filed July 6, 1976, Ser. No. 702,859
Claims priority, application Germany, July 8, 1975, 2530361
Int. Cl.[2] F16B *13/06*
U.S. Cl. 85—69 **13 Claims**



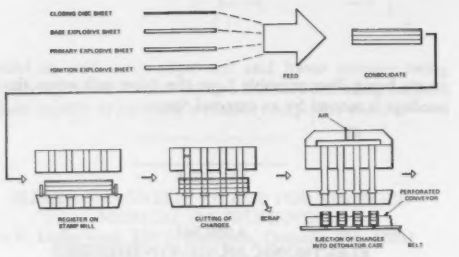
1. An anchoring device for use in mounting an object to a supporting structure, comprising a first element adapted to be received and anchored in a hole of a structure; a second element having a first portion located in said hole and secured in said first element, and a second elongated portion extending outwardly from said hole; means for positioning an object to be mounted at any of a plurality of distances from the structure, comprising an adjustable element in engagement with the object and being mounted on said second portion for movement in direction of the elongation of the latter; means for preventing access of corrosion-producing media to said first and second elements at any of said distances, said preventing means comprising a protective sleeve surrounding said second portion intermediate the structure and the object and having a longitudinally-extending tubular end section, and a tubular extension section extending from said adjustable element in direction towards said first element and sealingly engaging said tubular end section, at least one of said tubular sections overlapping the other of said sections so as to provide sealing contact with the latter at any selected distance determined by said adjustable element; and an abutment member mounted on said second portion and engaging the structure in the region of the hole opening, said abutment member being formed with an annular recess for receiving another tubular end section of said protective sleeve in sealing relationship.

4,050,347

METHOD FOR PRODUCING EXPLOSIVE TRAINS

Stanley M. Adelman, Randolph Township, Morris County; Donal G. Ellington, Wharton, and Philip J. Quatrochi, Stanhope, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 9, 1976, Ser. No. 703,992
Int. Cl.[2] C06B *21/00*
U.S. Cl. 86—20 R **4 Claims**



1. A method for producing at least one explosive train which comprises superposing

a. a first layer of sheet explosive comprising finely divided particles of an ignition explosive and a binder therefor; and

b. a second layer sheet explosive comprising finely divided particles of a primary explosive and a binder therefor;

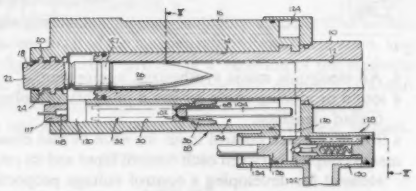
coring the resulting structure of superposed sheets and ejecting said core of explosive train into a cup container.

4,050,348

LIQUID PROPELLANT GUN (CONTROLLED LEAKAGE REGENERATIVE PISTON)

Alfred Rapp Graham, Burnt Hills, N.Y., assignor to General Electric Company, Burlington, Vt.

Filed June 10, 1976, Ser. No. 694,866
Int. Cl.[2] F41F *1/04*
U.S. Cl. 89—7 **6 Claims**



5. A process of charging a liquid propellant gun having a differential piston with propellant injection bores therethrough for regenerative injection of propellant into the combustion chamber from a propellant pumping chamber, wherein said piston interfaces both said combustion chmber and said pumping chamber, comprising:

translating said piston to provide said pumping chamber with substantially zero volume and said combustion chamber with its maximum volume;

admitting liquid propellant under pressure into said pumping chamber to translate said piston to increase the available

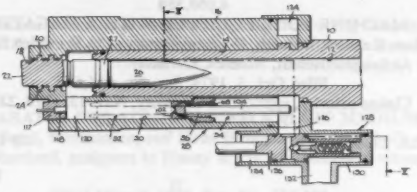
volume of the pumping chamber and to decrease the volume of the combustion chamber and to concurrently force a quantity of propellant from said pumping chamber through said injection bores and atomizing said quantity of propellants into droplets and into said combustion chamber.

4,050,349

LIQUID PROPELLANT GUN (SCALING WITH MULTIPLE COMBUSTION ASSEMBLIES)

Alfred Rapp Graham, Burnt Hills, N.Y., assignor to General Electric Company, Burlington, Vt.

Filed June 10, 1976, Ser. No. 694,869
Int. Cl.[2] F41F *1/04*
U.S. Cl. 89—7 2 Claims



1. A liquid propellant gun comprising:

a gun barrel having a bore and a projectile receiving chamber, both disposed along a first longitudinal axis;

an annular row of a plurality of combustor assemblies, each respectively comprising a liquid propellant supply chamber, a combustion chamber and a regenerative piston for pumping liquid propellant from said supply chamber into said combustion chamber, each respectively disposed along a respective one of a like plurality of second longitudinal axes, said second longitudinal axes being uniformly spaced apart, parallel to each other and to said first longitudinal axis and uniformly spaced from said first longitudinal axis, each of said plurality of combustion chamber also including a respective one of a like plurality of igniter means; and

conduit means coupling each of said combustion chambers to said projectile receiving chamber for transmitting combustion gas from each said combustion chamber to said projectile receiving chamber.

4,050,350

GEAR FINISHING

Richard W. Tersch, Grosse Pointe Woods, and Arthur B. Bassoff, Oak Park, both of Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed Aug. 4, 1975, Ser. No. 601,915
Int. Cl.[2] B23F *19/06*
U.S. Cl. 90—1.6 R 10 Claims

1. A gear honing machine comprising

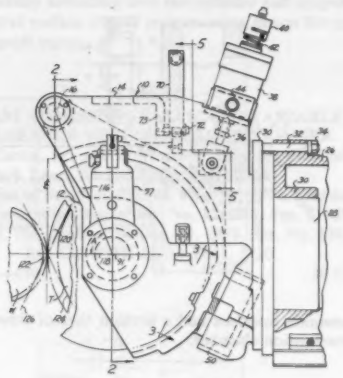
a rotary work support having means to support a work gear member for rotation on the rotation axis of said work support,

a rotary tool support positioned relative to said work support to support a honing tool member in mesh with a gear member on the rotary work support for rotation on the rotation axis of said tool support,

a gear-like honing tool member on said rotary tool support,

means operative to drive one of said supports in rotation to rotate the gear and tool carried thereby in tight meshed relation,

pivot mounting means pivotally mounting one of said supports, the pivot axis of said mounting means being located at a position displaced substantially from the line which is perpendicular to the line of centers of the rotary supports and which passes through the center of the pivotally mounted support, the displacement being in a direction toward the line perpendicular to the line of centers which bisects the acute angle between the lines of action of the



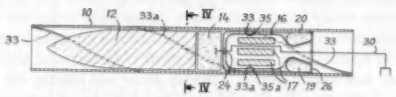
gear and tool members, and occupying a position substantially within such acute angle.

4,050,351

ASSEMBLY FOR LAUNCHING A PROJECTILE

Emile J. Stauff, Versailles, France, assignor to Societe Anonyme Dite: Societe Europeenne dePropulsion, Puteaux, France

Filed May 4, 1976, Ser. No. 683,001
Int. Cl.[2] F41F *3/02, 15/00*
U.S. Cl. 89—1.701 17 Claims



1. A projectile launching assembly including a launch tube, a charge of gunpowder located in said launch tube for communication therewith upon ignition and for firing from said tube a projectile which is placed in said tube in front of said gunpowder charge, means permitting, upon firing, the application of pressure of gases from said gunpowder charge against the rear of the projectile and the inner wall of the launch tube, a braking propellant located in said launch tube behind said gunpowder charge, a ballast material carried by said braking propellant, and means for sequential ignition of said gunpowder charge followed by ignition of said braking propellant.

4,050,352

RENEWABLE LIQUID INVESTMENT SEAL

Douglas Pray Tassie, St. George, Vt., assignor to General Electric Company, Burlington, Vt.

Filed Mar. 19, 1976, Ser. No. 668,546
Int. Cl.[2] F41F *1/04*
U.S. Cl. 89—7 15 Claims

5. An engine comprising:

a combustion chamber having an outlet port;

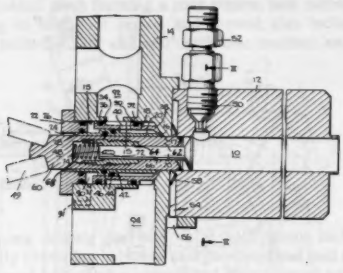
a conduit for juxtaposition with said outlet port;

said conduit, when juxtaposed with said outlet port, having a common interface therewith;

first means for providing combustion gas at a variable first pressure in said chamber;

second means for providing a liquid into said common inter-

face at a variable second pressure which is always greater than said first pressure, whereby said liquid seals said



common interface and a portion thereof flows into said combustion chamber.

4,050,353

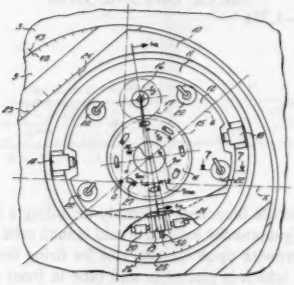
INDEX GENERATION METHOD AND MACHINE FOR PRODUCTION OF BEVEL GEARS

Lothar Bachmann, and Karl-Heinz Engemann, Karl-Marx-Stadt, Germany, assignors to Veb Werkzeugmaschinenkombinat "7.Oktober, Karl-Marx-Stadt, Germany

Continuation-in-part of Ser. No. 433,626, Jan. 16, 1975, abandoned. This application June 9, 1975, Ser. No. 585,169

Int. Cl.[2] B23F *9/10*

U.S. Cl. 90—5 **15 Claims**



1. In the rolling method for producing spiral and hypoid bevel gears wherein a cradle supported in a tool holder is rotatable about a cradle axis and supports a spread blade cutter head rotatable about a cutter axis spaced from and parallel to the cradle axis and together with the cutter moves in one rolling direction relative to the tool holder and to the turning work piece to cut one tooth flank of a tapering tooth gap and moves in the opposite rolling direction relative to the tool holder and to the turning work piece to cut the other tooth flank of the tapering tooth gap; the improvement in that the work cycle comprises:

cutting the one tooth flank by rolling the rotating cutter head in the first direction with a specific ratio of roll between the cradle and the workpiece so that the axis of the cutter head rolls from a first position along a first arcuate path about the cradle axis to a second position at the end of the first arcuate path;

then, swinging the rotating cutter head toward the other tooth flank about a swivel axis parallel to and offset from the axes of the cradle and cutter head so that the axis of the cutter head is swung to a third position, the second and third position of the cutter head axis lying along the path of a swivel arc generated about the swivel axis and also lying along an arc intersecting the swivel arc at the second and third positions of the cutter head axis and generated about an axis situated on the center line of the tapering tooth gap at the narrowest location thereof;

then, cutting the other tooth flank by rolling the rotating cutter head in the opposite direction with the same ratio of roll between the cradle and work piece so that the axis of the cutter head rolls from the third position to a final position along a second arcuate path spaced from and concentric with the first arcuate path;

then, in the final position of the cutter head, swinging the cutter head about the swivel axis to dispose the axis of the cutter head in the first position.

4,050,354

MACHINE TOOL EQUIPPED WITH A MAGAZINE

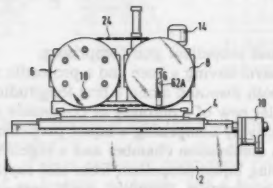
Hans Kuhnert, Munich, Germany, assignor to Friedrich Deckel Aktiengesellschaft, Munich, Germany

Filed Oct. 3, 1974, Ser. No. 511,686

Claims priority, application Germany, Nov. 13, 1973, 2356612

Int. Cl.[2] B23C *1/04, 1/16*

U.S. Cl. 90—13 C **9 Claims**



1. A machine tool, comprising:

base means;

at least one tool magazine movably mounted on said base means and rotatable about a horizontal axis, said tool magazine having a plurality of separately drivable tools and tool spindles therefor disposed parallel to and spaced from the axis of said tool magazine;

guide drum means disposed alongside said tool magazine and movably mounted on said base means and rotatable about a horizontal axis; and

control means for controlling translatable movement of said tool magazine and said guide drum means for simultaneous movement and so that said movements of said tool magazine are the same as said guide drum means in all the directions of motion, said guide drum means including tracer means spaced from the axis of rotation thereof and rotatable therewith for tracing the profile or contour of a master or pattern.

4,050,355

INDEXING DEVICE

Karl G. Niskanen, Latrobe, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Filed Aug. 16, 1976, Ser. No. 714,606

Int. Cl.[2] B23F *23/08;* **B23Q** *17/00*

U.S. Cl. 90—56 R **5 Claims**

1. In combination; a rotary table and an indexing device therefor, said table having follower elements thereon in circumferentially distributed relation, a drive block adjacent the table having a slot therein for receiving a follower and movable for engaging a said follower, and actuating means connected to said block and operable for moving said drive block

bodily in an orbital path without rotation during which said slot in the drive block engages a follower and moves it and the

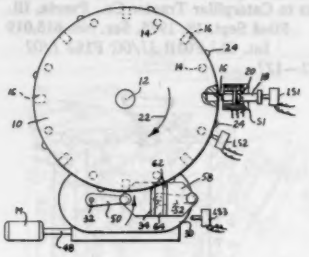


table in one direction a distance equal to the spacing between said followers and then releases the follower from the slot.

4,050,356

APPARATUS FOR CONTROLLING A FLUID MEDIUM

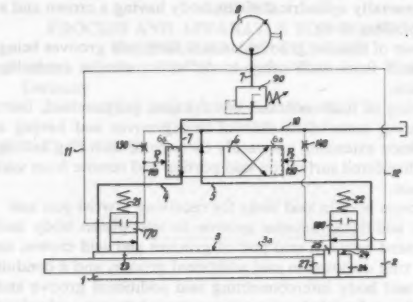
Hans Jaggi, Wolfhausen, and Hans Heimgartner, Jona, both of Switzerland, assignors to Haeny & Cie AG, Meilen, Switzerland

Filed Mar. 7, 1975, Ser. No. 556,395

Claims priority, application Switzerland, Mar. 11, 1974, 3345/74

Int. Cl.² F01L *25/06*

U.S. Cl. 91—306 **7 Claims**



1. An apparatus for the control of a fluid medium, comprising a double-acting reciprocating piston, a cylinder for housing said piston, a switching element actuated by a pressurized fluid medium, pressure source means for supplying pressurized fluid medium to the switching element, a pair of actuation elements working in opposed relationship to one another, said switching element being reversible between two switching positions by means of said two actuation elements, an actuation line provided for each actuation element for connecting the pressure source with each such actuation element, a respective normally closed shutoff valve having an inlet side and an outlet side for admitting pressurized fluid from the pressurized source means to the actuation line of each actuation element, said shutoff valves having only two positions defining an open position communicating said inlet and outlet sides and a normally closed position blocking flow between said inlet and outlet sides, means normally closing the shutoff valves, a respective throttle means provided for each actuation element and shutoff valve and connected with the outlet side of its associated shutoff valve for increasing the pressure in the actuation line to thereby operate its associated actuation element, each said actuation element being directly connected to its associated actuation line between the outlet side of its associated shutoff valve and its associated throttle means, the inlet side of each shutoff valve being directly connected to the pressure source, said shutoff valves being arranged respectively at the region of the end positions of the stroke of the reciprocating piston, each shutoff valve having a respective plunger laterally extending into the cylinder and cooperating with a control surface of said reciprocating piston for operating said shutoff valve.

4,050,357

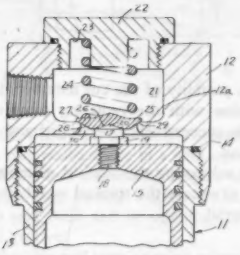
STEAM ADMISSION VALVE AND VARIABLE CLEARANCE VOLUME STEAM CYLINDER

J. Warne Carter, Sr., and J. Warne Carter, Jr., both of 2206 Weeks Park Lane, Wichita Falls, Tex. 76354

Continuation of Ser. No. 483,046, June 25, 1974, abandoned, which is a continuation of Ser. No. 321,375, Jan. 5, 1973, abandoned. This application Dec. 10, 1975, Ser. No. 639,585

Int. Cl.² F15B *13/04*; F01L *1/20*

U.S. Cl. 91—410 **20 Claims**



1. In a steam engine, a cylinder containing a reciprocable piston, a steam admission chamber communicating with the cylinder through a circular valve port in an end wall of the cylinder, an annular surface portion of the end wall surrounding the port forming a valve seat in said chamber, a valve element in the chamber having an annular sealing surface to engage the valve seat, spring means biasing the valve element into seated position to close the valve port, and a substantially rigid valve lifter member fixed to an uppermost portion of the piston, the piston, the valve element, spring means and valve lifter member being disposed on a common longitudinal axis, the lifter member having an abutment surface for engaging a cooperable surface on the valve element to unseat the valve element against the force of said spring means to open the valve port, the spring means having sufficient strength to maintain the abutment surface and the cooperable surface in engagement while the valve element is unseated, said abutment surface and said cooperable surface comprising non-planar conforming surfaces of revolution coaxially related to said valve seat, whereby the sealing surface of the valve element is maintained both parallel to and centered in relationship to the valve seat in the seating of the valve element.

4,050,358

DIAPHRAGM AND METHOD OF MAKING

John Humberstone, Westminster; William L. Deal, El Segundo, and Arthur E. Edgington, Westminster, all of Calif., assignors to Harbor Products, Inc., Long Beach, Calif.

Filed Sept. 22, 1976, Ser. No. 725,364

Int. Cl.² F01B *19/00*; F16J *3/02*

U.S. Cl. 92—103 F **14 Claims**

1. A diaphragm comprising:

a. a deformable base member having a substantially U-shaped surrounding fold;

b. a plurality of axially superimposed members of a woven fabric material molded to said base member, each of said members being preformed to provide:

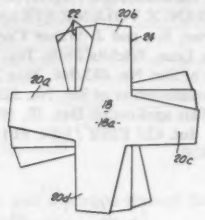
a central area, and a plurality of integral radially extending spaced apart arm portions;

c. said superimposed members being in stacked relation with the arm portions of the adjacent members being succes-

sively overlapped and relatively offset, and extending across and being conformed to said U-shaped fold.

9. The method of fabricating a diaphragm, which comprises the steps of:

a. cutting cross-shaped members with radiating spaced arms from an elastomer-coated sheet material of woven fabric in which the threads are in crossing relation;



b. stacking a plurality of the cut members in superimposed axial relation with the radiating arms of adjacent cut members in successively overlapped and angularly offset relation; and

c. thereafter subjecting the stacked members to a molding operation to encase the stacked members with an elastomeric material.

4,050,359

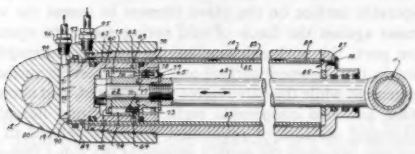
HYDRAULIC POWER TRIM AND POWER TILT SYSTEM SUPPLY

William B. Mayer, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Division of Ser. No. 610,415, Sept. 4, 1975, Pat. No. 3,999,502. This application May 17, 1976, Ser. No. 687,383

Int. Cl.² F01B *3/00;* F16J *1/10*

U.S. Cl. 92—113 **7 Claims**



1. In a combined trim and shockabsorbing piston-cylinder apparatus comprising a cylinder having end closure walls at the opposite ends, means to supply hydraulic fluid to the opposite ends of said cylinder for oppositely positioning of a shock piston assembly and piston rod, said piston assembly comprising a shock piston slidably mounted within the cylinder with a sliding seal between the periphery of the piston and the cylinder, a piston rod being secured to the piston and extending out of one end of the cylinder, said shock piston having a valve means responsive to shock forces on said piston rod and cylinder to establish a shock absorbing fluid flow from one side to the opposite side of the piston, a trim piston unit located to the cylinder side of the shock piston and slidably sealed to the cylinder, said trim piston unit and shock piston being mounted in releasable telescoped relation to define a variable sized reservoir therebetween to the one side of the shock piston and minimizing the overall length of the piston assembly, whereby said shock piston and said trim piston unit can move together through abutment with one another or be spaced from one another.

4,050,360

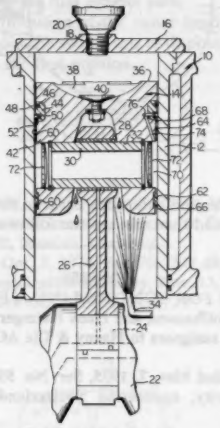
OIL DAMPED PISTON

Harold C. Powers, and Robert B. Cambron, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 19, 1975, Ser. No. 615,019

Int. Cl.² F01B *31/00;* F16J *1/02*

U.S. Cl. 92—127 **1 Claim**



1. A piston assembly for lunbricated internal combustion engines, pumps, compressors, or the like, comprising:

a. a generally cylindrical piston body having a crown and a depending skirt;

b. a pair of annular grooves on said skirt, said grooves being spaced from each other to define an annular receiving space;

c. a ring of heat resistant, low friction, polymerized, inert bearing material in each of said grooves and having a portion extending outwardly therefrom, each ring having a chamfered surface on said portion and remote from said space;

d. a cross bore in said body for receiving a wrist pin; and

e. an additional annular groove in said piston body and located between said pair of grooves and said crown, an oil ring disposed in said additional groove, and a conduit in said body interconnecting said additional groove and said annular lubricant receiving space between said pair of grooves.

4,050,361

PLOW FOLDING AND HEAT SEALER APPARATUS FOR CONTINUOUS BUSINESS FORMS

John E. Traise, Niagara Falls, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

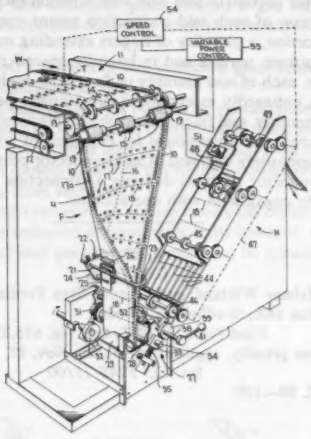
Continuation-in-part of Ser. No. 653,882, Jan. 30, 1976, abandoned. This application Jan. 17, 1977, Ser. No. 760,020

Int. Cl.² B31B *23/00*

U.S. Cl. 93—1 F **12 Claims**

1. An apparatus for effecting plow folding and subsequent heat sealing of a continuous web, comprising, a plow folding station for effecting a longitudinal folding of the web about a longitudinal line of weakening thereof, a heat sealing station for effecting a sealing together of the folded-over portions of the web as hot-melt adhesive disposed between the portions is melted by heating, first means for feeding the web in a flat and unfolded condition at a first rate of speed into said plow folding station, second means at said heat sealing station for feeding the folded and sealed web outwardly of the apparatus at a second rate of speed faster than said first rate to thereby tension the web at said heat sealing station to a greater extent than at said folding station, and a combined wb drive and snubber roll means disposed between said stations for initially feeding the

folded web into said second feed means at said heat sealing station and for subsequently snubbing the web, whereby the higher tensioned web at said heat sealing station is isolated



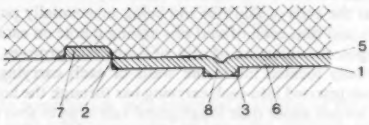
from the lesser tensioned web at said folding station, said web drive and snubber roll means including a roll mounted for movement between a drive and a snubbing position.

4,050,362

PROCESS AND APPARATUS FOR BLANKING CARDBOARD AND THE LIKE

Friedrich Schröter, 3004 Isernhagen, NB-Sud am Waldchen 8, Germany

Filed July 5, 1974, Ser. No. 485,776
Int. Cl.² B31B *1/20*
U.S. Cl. 93—58 R **3 Claims**



1. A process for cutting a sheet of low tensile strength material such as paper or cardboard including the steps of, contacting a first side of said sheet with a cutting die formed with a cutting zone having a die step with a die surface extending away from one side of said die step at a first height and a die surface extending away from an opposite side of said die step at a height differential from the first named die surface, contacting an opposite side of said sheet with a resiliently displaceable elastic member positioned in juxtaposed relation to said cutting zone, and pressing said sheet by said elastic member against a higher of the die surfaces by relative displacement of said cutting zone and said elastic member toward each other, wherein the improvement of said process is comprised of the steps of:

pressing said sheet by said elastic member against a lower of said die surfaces by relative displacement of said cutting zone and said elastic member toward each other until said sheet assumes the profile of said die in said cutting zone and across said die step; and

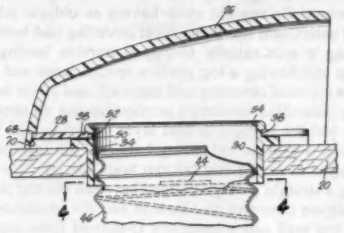
thereafter pressing said sheet by said elastic member against said die step by further relative displacement of said cutting zone and said elastic member toward each other while said sheet is supported between said elastic member and the surfaces of each side of said die step until pressure from said elastic member causes parting of said sheet precisely at said die step.

4,050,363

AIR VENT COVER ASSEMBLY

Harry W. Fuerst, 1740 Albion, Los Angeles, Calif. 90031

Filed Jan. 29, 1976, Ser. No. 653,441
Int. Cl.² F24F *7/00*
U.S. Cl. 98—37 **3 Claims**



1. A detachable deck vent assembly comprising:

a connecting ring positionable in a vent opening of a deck;

means for affixing said connecting ring to said deck;

said connecting ring having a groove therein positioned external to said deck and an opening through said ring within said groove;

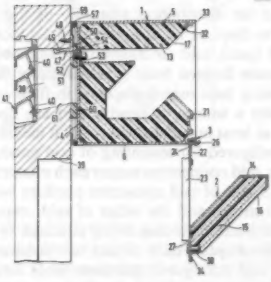
a scoop member for said vent opening releasably connected to said deck by attachment to said connecting ring groove, through a snap ring affixed to said scoop member and adapted for clamping engagement with said connecting ring groove to attach said scoop member to said connecting ring, and said snap ring having an orientation lug formed on the inner edge thereof and adapted to engage said groove opening to prevent rotation of said scoop member about said connecting ring.

4,050,364

VENTILATING DEVICE

Julius Maus, Stuttgart, Germany, assignor to Gretsch-Unitas GmbH Baubeschlagfabrik, Germany

Filed Feb. 11, 1976, Ser. No. 657,220
Claims priority, application Germany, Feb. 12, 1975, 7504175[U]
Int. Cl.² F24F *7/00*
U.S. Cl. 98—37 **21 Claims**



1. A ventilating device for mounting on a wall, support frame, which has an air flow passage therein, comprising a housing having a back wall adapted to be mounted on the wall having the air flow passage, said back wall having at least one inlet opening, a top and a bottom wall extending outwardly from the back wall adjacent the top and bottom thereof respec-

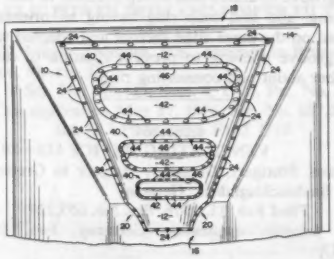
tively, an outlet between said top and bottom walls at the opposite ends thereof to said rear wall, a cover hinged at at least one of said top and bottom walls and adapted to close the outlet, a top, bottom and a cover layer of insulating material secured respectively to said top wall, said bottom wall and said cover, a layer of insulation material on said cover sealing with a portion of the layer secured to one of said top and bottom walls, said layers of insulation on each of said top and bottom walls and said cover being spaced apart in areas to define a continuous meandering air flow passage from said inlet to said outlet, said insulating layer connected to said top wall comprising a substantially straight piece having an oblique edge adjacent said outlet, said insulating layer covering said bottom wall comprising a substantially C-shaped portion having spaced apart legs and having a top portion spaced from said layer of insulation material covering said top wall, said cover having an obliquely extending insulation portion having an area sealing with the oblique portion of said layer covering said top wall and having a portion extending between the legs of the C-shaped layer covering said bottom wall, the air flow passage including a straight passage defined between the top portion of said insulation covering said bottom and the insulation covering said top wall and a generally U-shaped flow passage between the insulation covering said cover and the insulation covering said bottom wall between the leg portions thereof.

4,050,365

AIR DISTRIBUTION ASSEMBLY

Eugene J. Freeman, Jr., Tampa, Fla., assignor to Ever-Wear Products, Inc., Tampa, Fla.

Filed July 15, 1976, Ser. No. 705,624
Int. Cl.² G03C 9/00
U.S. Cl. 98—40 C **4 Claims**



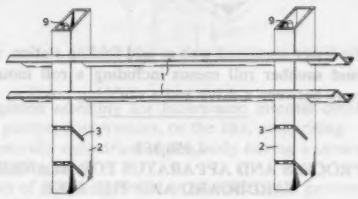
1. An air distribution assembly of the type primarily designed to disperse air at predetermined locations throughout a defined space, said air distribution assembly comprising: conduit means formed from a substantially flexible material and comprising base means disposed in fluid communicating relation with a source of conditioned air; connection means attached at least in part to said conduit means and being disposed and configured for mounting of said conduit means on a wall surface, said connection means each comprising two connector portions, one of said connector portions being attached to said conduit means and the other of said connector portions of a given connection means being attached to the wall surface of the defined space, each of said two connector portions dimensioned and configured for removable attachment to one another, a plurality of said connection means being mounted in spaced relation to one another along a major portion of the peripheral edge of said conduit means; and at least one vent means formed in said conduit means and disposed in interconnecting fluid communication between the interior of said conduit means and the defined space, said vent means comprising a vent flap and aperture means formed in said conduit means and defined by removal and displacement of said vent flap externally of said conduit means, at least one of said plurality of said connection means attached to said vent means, one of said connector portions being attached to said vent flap and the other of said connector portions being attached to the surrounding portion of said conduit means defining said aperture means and disposed thereon in engageable relation to said one connector portion of said vent flap; wherein each said connector portion of each said connection means comprises a platform portion, a plurality of fingers extending outwardly from said platform portion and in laterally spaced relation to one another, each of said plurality of fingers on each said platform portion outwardly extending in substantially parallel relation to one another, said fingers on each said platform portion being configured and dimensioned for engagement with said fingers of the oppositely disposed of said connector portions, whereby two connector portions defining a connection means are removably engageable with one another.

4,050,366

GRATING

Curt Helmer Wiklund, and Gunnar Sten Frodin, both of Vattugatan 14A, Sundbyberg, Sweden

Filed Nov. 26, 1975, Ser. No. 635,353
Claims priority, application Sweden, Nov. 27, 1974, 7414864
Int. Cl.² F24F 13/00
U.S. Cl. 98—110 **9 Claims**



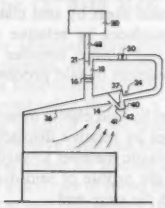
1. A grating structure comprising two tubular carrying bars each provided with a plurality of parallel grooves, a plurality of ribs each inserted into said grooves in such a manner so as to support said bars in a substantially parallel position one to the other near the ends of said ribs and being substantially perpendicular to said ribs, each of said ribs having a hole on each end which, upon the insertion of said ribs into said grooves, is at least partially located inside the walls of each carrying bar, square rods inserted into each carrying bar through the holes in said ribs, turned about their longitudinal axis so as to abut those parts of the grating which define the portions of the holes which are located inside the walls of the carrying bars.

4,050,367

VENTILATING SYSTEM FOR INDUSTRIAL MACHINES

Marion L. Eakes, Greensboro, N.C., assignor to Marion L. Eakes Co., Greensboro, N.C.

Filed May 6, 1976, Ser. No. 683,733
Int. Cl.² F23J 11/00
U.S. Cl. 98—115 LH **2 Claims**



1. An improved process for collecting, cleaning up, and disposing contaminated exhaust gases generated at a work table comprising the steps of:

a. collecting the contaminated exhaust gases in an exhaust

hood having a longitudinally extending inlet above at least one edge of said work table by applying negative pressure to said inlet thereby entraining said exhaust gases at a capture point below said inlet and above said work table;

b. directing said collected gases toward a gas separating means between said collecting point and the outside atmosphere;

c. drawing off a portion of said collected gases upstream of said gas separating means;

d. returning said drawn off portion of contaminated gases and directing said portion of contaminated gases generally upwardly toward said inlet as an air stream from a nozzle positioned closely adjacent, but slightly downwardly and outwardly from said inlet;

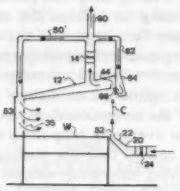
e. whereby said returned air stream causes the capture point of the contaminated exhaust gases to be lowered, and the capacity of said gas separating means to be reduced.

4,050,368

EXHAUST SYSTEM FOR INDUSTRIAL PROCESSES

Marion L. Eakes, Greensboro, N.C., assignor to Marion L. Eakes Co., Greensboro, N.C.

Filed Jan. 2, 1976, Ser. No. 645,997
Int. Cl.² F23J *11/00*
U.S. Cl. 98—115 LH **14 Claims**



1. In combination with industrial machines of the type having a work table surrounded on two sides, the back, and top by a wall-like enclosure leaving an open front side, and generating a substantial amount of contaminated exhaust gases, an improved ventilating system comprising:

a. an air exhaust means positioned above said enclosure communicating with the air space above said work table along said open front side and including a first fan for removing said exhaust gases from said air space and a gas separating means for cleanup of said contaminated exhaust gases prior to delivery to said outside;

b. an air delivery means including a second fan for drawing in makeup air from a source other than the atmosphere surrounding said work table and introducing said makeup air from a point below the front edge of said work table in a direction toward said exhaust means and including a second fan for drawing in makeup air from a source other than the atmosphere surrounding said work table and;

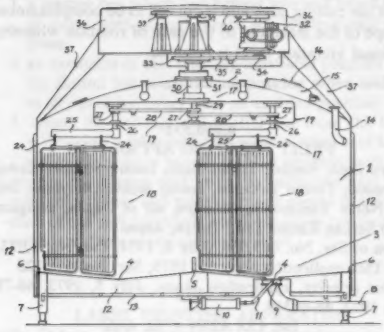
c. the air from said air delivery means forming a generally vertical air curtain extending between said delivery means and said exhaust means, whereby said exhaust gases are confined within the air space above said work table until withdrawn through said exhaust means, and further whereby said air delivery means provides a source of replacement air to replenish the volume of air withdrawn, so that conditioned air in the work room surrounding said industrial machine is substantially unaffected.

4,050,369

CHEESE VAT

Thomas Kevin Mulvihill, Limerick, and Denis Murphy, Charleville, both of Ireland, assignors to Golden Vale Food Products Limited, Ireland

Filed Nov. 3, 1972, Ser. No. 303,616
Claims priority, application Ireland, Nov. 4, 1971, 1395/71
Int. Cl.² A01J *15/02*; B01F *7/00*; B29B *1/10*
U.S. Cl. 99—463 **7 Claims**



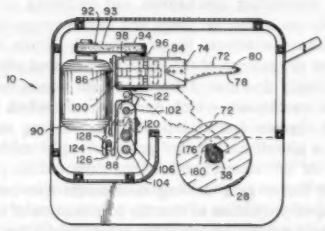
1. An enclosed vat comprising a vessel, stirrer means in said vessel for stirring contents therein, aid vessel being cylindrical and having a base portion, said base portion having a bottom wall, said bottom wall being in the form of a continuous annular upwardly opening trough, and said trough having a lowermost portion concentric with and equidistant from both the center and periphery of said bottom wall.

4,050,370

SPIRAL MEAT SLICER WITH IMPROVED RECIPROCATING KNIFE STRUCTURE

Louis Charles Schmidt; Bloomfield Hills, Mich., and Richard P. Farbolin, Lilburn, Ga., assignors to Schmidt, Trustee under Harry J. Hoenselaar Trust Agreement of Oct. 4, 1973, Mary Jane, Troy, Mich.

Filed Mar. 11, 1976, Ser. No. 665,800
Int. Cl.² A23N *23/00*, *7/00*; A47J *17/16*
U.S. Cl. 99—538 **2 Claims**



1. A spiral meat slicer for forming a continuous spiral slice on a cut of meat having an irregularly shaped bone extending therein comprising means for mounting the meat with the bone as a substantially vertical axis about which to rotate the meat, a vertically movable carriage, a knife for slicing the meat mounted on said carriage, said knife being positioned with respect to the axis of rotation of the bone to enable a spiral cut to be made in the meat, said knife being an elongated member having a relatively wide base for mounting on said carriage said knife including an inner end and an outer end and a rearward edge and a forward edge, said forward edge including a cutting edge for slicing the meat, said cutting edge comprising a first portion extending from the base and curving toward said

rearward edge and a second straight portion extending therefrom to near the outer end of the knife blade, means for longitudinally reciprocating the knife against the meat, means for automatically tensioning said knife against the meat, means for rotating the meat, and means for relatively moving said carriage vertically with respect to the meat to advance the knife along the axis of rotation of the meat to form a continuous spiral slice in the meat, further characterized in that said curved portion of the cutting edge extends to about the midpoint of the cutting edge and is curved to be complementary to the shape of the meat and to the path of rotation whereby the operational vibration level is reduced.

4,050,371

FRUIT TREATING APPARATUS

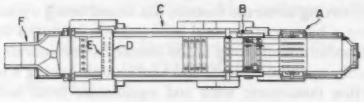
Yasuhiro Sato, Sendai; Toshio Sato, Izumi; Shuichi Kawasaki, Kawasaki; Toshio Takaishi, Izumi; Sadao Okuyama, Sendai, and Norio Yamanashi, Shimizu, all of Japan, assignors to Toyo Seikan Kaisha Ltd., Tokyo, Japan

Division of Ser. No. 485,556, July 3, 1974, Pat. No. 4,013,001. This application Sept. 30, 1975, Ser. No. 618,123

Claims priority, application Japan, July 5, 1973, 48-79887; July 6, 1973, 48-80349

Int. Cl.² A23N *4/12, 4/22*

U.S. Cl. 99—550 **5 Claims**



1. A fruit treating apparatus for fruits each having an indent therein and a sature line comprising a fruit treating mechanism including a tank having a water level therein for receiving and advancing fruits to be treated in such a manner that the fruits are longitudinally aligned in the water for preventing the fruits from bridging one another, said tank having an inlet end for introducing fruits into the tank and an outlet end for removing fruits from the tank, a lifter at the outlet end of said tank; a connecting mechanism for receiving fruits from said lifter and for smoothly conveying the fruits received from said lifter; a fruit posture control mechanism arranged to receive the fruits from said connecting mechanism and including cup-shaped receivers for receiving the fruits and means cooperating with said cup-shaped receivers for orienting the fruits in such a manner that the indents of the fruits are oriented substantially in the vertically downward direction, said means including a finder gear mechanism which operated only when the fruits are placed thereon and said finder gear driving mechanism including a plurality of finder gears arranged with a phase difference of 90° to each other and disposed in successive order, said finder gear driving mechanism also including a wedge-shaped projection so that the combination of said finder gears and said projection orient the sature line of the fruits in a predetermined direction with said wedge-shaped projection registering with the stem indent of the fruits; fruit slivering mechanism for slivering the posture-control fruits on said receivers including an upper cutter and a lower cutter; a fruit pitting mechanism arrange to receive the fruits from said fruit slivering mechanism for severing each of said fruits slivered and separating the flesh and pit, said fruit pitting mechanism including an upper rotary cutter and a lower rotary cutter; and a flesh-pit separating and recovering mechanism arranged to receive the separated flesh and pits for separating the flesh and pits and for recovering the flesh, said flesh-pit separating and recovering mechanism including means for flowing the flesh along a path of travel while the pits are dropped out of the path of travel.

4,050,372

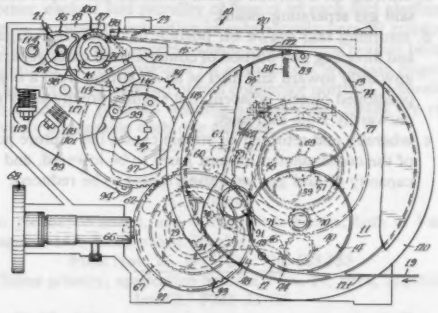
AUTOMATIC STRAPPING MACHINE

Robert J. Kobiella, Rolling Meadows, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed Jan. 21, 1976, Ser. No. 650,891

Int. Cl.² B65B *13/02*

U.S. Cl. 100—2 **12 Claims**



10. A method for securing a thermoplastic strap around a package comprising the steps of

forming a length of strap roll into a loop around the package to provide overlapping strap portions;

gripping the leading strap end of said length of strap;

tensioning the loop around the package by pulling on said strap in a direction opposite from the strap feed direction;

gripping the overlapping strap portions so as to maintain tension in the loop and to provide an untensioned, underlying, exposed trailing strap end portion;

severing the forming loop from the strap roll; thereafter pressing an inner face region of the extreme end of the untensioned, exposed trailing strap end portion against an inner face of an overlying loop strap in tension; and

causing relative longitudinal oscillatory motion between the extreme end of the untensioned, exposed trailing strap end portion and the overlying loop strap section in tension to generate heat and to fuse the trailing strap end portion with the overlying loop strap section.

4,050,373

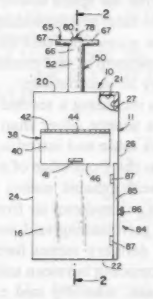
MANUAL TRASH COMPACTOR

James J. Hellmann, 6600 SW. 127th St., Miami, Fla. 33156

Filed July 8, 1976, Ser. No. 703,352

Int. Cl.² B30B *15/06*

U.S. Cl. 100—240 **4 Claims**



1. A manual trash compactor comprising:

a. a housing adapted to receive therein an exchangeable bag for containing the trash;

b. access means associated with said housing to gain entrance thereto for depositing of trash within the bag, said

access means includes a hingeably mounted door on the front of said housing;

c. pressure applying means for compacting the trash within the bag, said pressure applying means including,

i. a plunger having a compacting head for engagement with the contents of the bag, said plunger includes a recess thereon,

ii. means for supporting said plunger for axial movement,

iii. gripping means extending outwardly of said housing for moving said plunger axially to reciprocate said head in a compacting direction,

d. weighting means associated with said pressure applying means to increase the weight thereof to facilitate the compacting of the trash within the bag;

e. said weighting means includes:

i. an aperture axially extending in said plunger,

ii. a cavity in said compacting head connected to said aperture at one end thereof to receive therein sand or other material for weight, and

iii. a cap for closing off said aperture at the other end thereof,

f. exit means associated with said housing to provide an opening for removal of the bag filled with compacted trash from within said housing, said exit means includes a hingeably mounted panel on one side of said housing adjacent to the bag so as to permit the removal of the bag with the compacted trash contained therein;

g. locking means for releasably retaining said pressure applying means at a height relative to the open end of the bag to permit the placement of trash through said access means below said compacting head;

h. said locking means includes a latch which is adapted to retain said plunger in a releasably fixed position; and

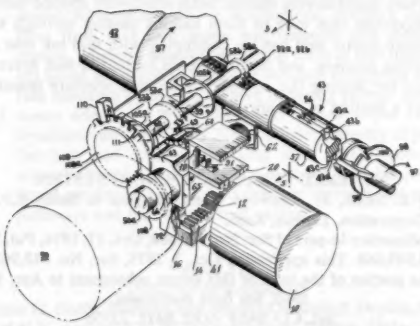
i. said latch includes a member movable between an extended position within said recess for locking said pressure applying means in a fixed position, to a retracted position out of bridging relation with said plunger, said latch member being spring loaded to automatically enter said recess at the desired level of said plunger.

4,050,374

METER SETTING MECHANISM

Frank T. Check, Jr., Hamden, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed June 21, 1976, Ser. No. 698,261
Int. Cl.[2] B41J *1/22*
U.S. Cl. 101—91 **10 Claims**



1. For use in a printing device having a rotatable printing drum and means for rotating said drum and further having banks of print wheels which may be set to different positions through a gearing assembly including a number of laterally-spaced, independently-rotatable gears, an improved gear-setting mechanism including:

a. a laterally-moveable yoke including restraining means for normally preventing rotational movement of the independently-rotatable gears;

b. a master gear rotatably mounted within said yoke for engaging a single one of the independently-rotatable gears at a time, during which time the engaged independently-rotatable gear can be rotated by the master gear;

c. a print interlock means for normally preventing printing by the printing device, said print interlock means further comprising:

1. a shutter bar which can extend into and block the path of movement of said means for rotating said printing drum;

2. an extension of said laterally-moveable yoke for holding the shutter bar in a blocking position when said yoke is in any position other than an enabled position;

3. means for driving said shutter bar from the blocking position to a released position only when said laterally-moveable yoke is in said enabled position; and

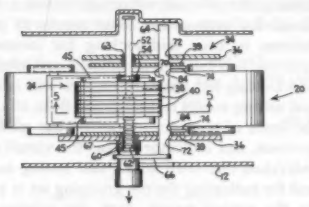
d. means for urging said yoke laterally into said enabled position wherein said print interlock means is released but each of the independently-rotatable gears continues to be restrained from rotational movement.

4,050,375

LABEL PRINTING APPARATUS

Alfreds Orlens, Old Greenwich, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Feb. 5, 1976, Ser. No. 655,480
Int. Cl.[2] B41J *1/60*; B41K *1/12*
U.S. Cl. 101—110 **1 Claim**



1. In an apparatus for sequentially printing at least two areas with characters such as one area with first bar code characters and a second area with second corresponding alpha-numeric characters, said apparatus comprising a main frame; a drum housing pivotably mounted in the main frame, said drum housing comprising two pivot plates, mounted for simultaneous pivoted movement in the frame, each having a locking bar receiving slot therein, the printing drum being mounted between portions of the pivot plates, and said locking bar spanning the distance between the slots on the pivot plates to pivot therewith, means for pivoting the drum housing; and a printing drum, mounted in the drum housing, including a plurality of annular printing discs each having a series of die groupings about its periphery, said discs having gear teeth about their inner peripheries and a generally axially extending groove associated with each die grouping, each die grouping having at least a first character printing die and a second peripherally displaced character printing die; an assembly for individually setting each disc, for locking all discs in relatively non-rotatable position and for simultaneously shifting all of the discs to place the first and then the second character printing die in printing position; said assembly comprising:

A. setting means for selectively engaging and rotating each individual printing disc to set one die grouping thereon for printing, said setting means further being disengageable simultaneously from all of the discs, and said setting means comprising a shaft mounted for rotation and for reciprocal movement in the direction of the axis of the printing drum, and a spur gear mounted for rotation and reciprocation with the shaft to selectively engage the inner gear teeth of each disc and to disengage from the inner gear teeth of all

discs, said spur gear having thickness less than the thickness of any disc, a detent means for positioning said spur gear in operative relation to the inner gear teeth of one disc at a time; and

B. locking bar means linked to said setting means for projecting into the axially extending disc grooves which correspond to all set die groupings, with the exception of the groove in the individual disc with which said setting means is engaged, and for projecting into the disc grooves which correspond to all set die groupings without exception when said setting means is disengaged from all of the discs to thereby lock all discs in relatively non-rotatable position, said disc grooves being formed on the outer periphery of each disc, said locking bar means also being relatively non-rotatably coupled to the drum housing to pivot therewith, said locking bar means having an elongated locking bar, having a notch with width greater than any disc, linked to said shaft for reciprocal movement therewith to position the notch adjacent the disc with which said spur gear is engaged and to position the notch non-adjacent all discs when said spur gear is disengaged from all discs, whereby pivoted movement of the drum housing causes simultaneous pivoted movement of said locking bar means and, hence, causes the discs to shift to place the first and then the second character printing dies of the set die groupings in printing position for sequential printing thereby; and

C. loading means for urging said locking bar means into the generally axially extending disc grooves, said loading means comprising, lever means mounted with said drum housing for pivoted movement about a fulcrum; spring means for urging said lever means to pivot about the fulcrum to urge said locking bar means into the disc grooves; and raised load bearing pad means formed with said locking bar means to engage said lever means when said setting means is disengaged from all discs to increase the force of urging said locking bar means into the disc grooves; and indicator means for visually indicating the individual disc with which said setting means is engaged and for indicating the die grouping set in printing position by the setting means, each die grouping including an indicating character and wherein said indicator means comprises a pointer mounted with said locking bar means to point to the disc with which said setting means is engaged and to point to the indicating character indicative of the die grouping in printing position.

4,050,376

SELECTIVE PRINTING APPARATUS

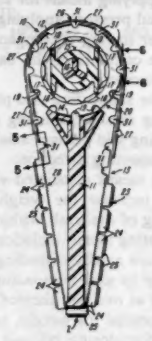
Jack D. Keefe, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation of Ser. No. 406,532, Oct. 15, 1973, abandoned. This application Jan. 17, 1975, Ser. No. 541,962

Int. Cl.[2] B41J *1/20*

U.S. Cl. 101—111 **29 Claims**

1. Selective printing apparatus, comprising: a stationary support disposed adjacent a printing zone, a rotatably mounted drive wheel, a printing band extending under tension about the support and the wheel, the printing band having a printing section and a non-printing human readable section, printing characters on the outer surface of the printing section, corresponding human readable indicia on the outer surface of the human readable section, only small lugs on the underside of the printing section, large lugs on the underside of the human readable section, large notches at the peripheral surface of the wheel, and small notches at the peripheral surface of the wheel between the large notches, whereby the large notches in the wheel can mesh with the large lugs to enable the selected printing character to be advanced to the printing zone while the small lugs can pass readily about the support, but in the event the printing section is brought into engagement with the wheel and a large notch in the wheel no longer meshes with a large lug then the small notches in the wheel can mesh with the



small lugs to enable the band to be returned to the position wherein a large notch can again mesh with a large lug.

4,050,377

HIGH SPEED PRINTER WITH HEATED APERTURE BOARD

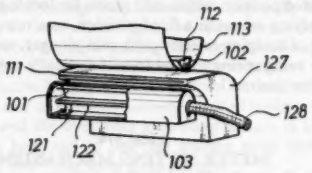
Akinori Watanabe; Katsuhide Tanoshima; Matsusaburo Noguchi, and Kinya Hattori, all of Tokyo, Japan, assignors to Oki Electric Industry Company, Ltd., Tokyo, Japan

Filed Oct. 3, 1975, Ser. No. 619,259

Claims priority, application Japan, Oct. 30, 1974, 49-124271

Int. Cl.[2] B41F *15/00;* **H01J** *1/02*

U.S. Cl. 101—114 **4 Claims**



1. A high speed printer of the type using an ink mist formed of charged ink particles, said printer comprising electrodes having high voltage impressed thereon to produce ions, an aperture board having electric fields selectively applied therein to modulate said ions to form cations passing through said aperture board, said cations combining with said ink mist for effecting printing, and heating means located in said aperture board for heating the air received in said aperture board to effect a heating of the aperture board.

4,050,378

METERED SPRAY DAMPENING SYSTEM

Roy R. Smith, Jr., Leawood, Kans., assignor to Smith R.P.M. Corporation, Lenexa, Kans.

Continuation-in-part of Ser. No. 515,688, Oct. 17, 1974, Pat. No. 3,949,668. This application Oct. 2, 1975, Ser. No. 618,962

The portion of the term of this patent subsequent to Apr. 13, 1993, has been disclaimed.

Int. Cl.[2] B41F *7/30;* **B41L** *25/06*

U.S. Cl. 101—147 **7 Claims**

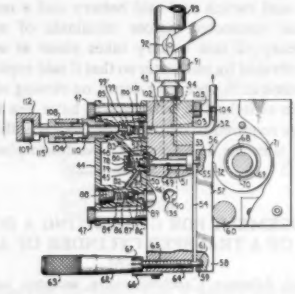
1. For use in combination with an offset printing press, a lithographic dampener system, said dampener system comprising:

a. a spray member having a plurality of dampening liquid atomizing spray nozzles, individual dampening liquid output conduit means connected at one end thereof to said nozzles,

b. a pump member having a plurality of individual, bubble and particle sensitive, reciprocal metering pumps respectively including an input portion containing a loaded input valve and an output portion containing a loaded output valve which periodically opens as a result of metering pump operation, said output valve being loaded to a substantially greater opening pressure than said input valve and a pump pathway extending between said input and output valves,

c. said output conduit means being respectively individually connected at the other end thereof to one of said metering pump output portions whereby each spray nozzle is connected to a separate metering pump, said metering pumps respectively having reciprocating pump means communicating with said pump pathways between said input and output valves and alternately increasing and decreasing the dampening liquid volume of the respective pump pathway,

d. a source of dampening liquid susceptible to bubble formation and particle inclusion therein, input conduit means connected between said liquid source and said respective



input portions, a feed pump operably located in said input conduit means,

e. pressure regulator means associated with said feed pump and together controlling the feed pressure of said dampening liquid into said respective input portions to a point above atmospheric pressure an amount sufficient to suppress the formation of bubbles and greater than that required to open said loaded input valve but less than the sum of the opening pressures of said input plus output valve, thereby causing said dampening liquid to be maintained substantially above atmospheric pressure during flow from said feed pump and through said metering pumps, whereby bubbles tending to form in said dampening liquid are urged to remain in solution permitting accurate metering by said respective metering pumps, and

f. means selectively maintaining said loaded output valves simultaneously in an open position independently of pump function and without blocking said output portions, whereby bubbles and particulate matter in said dampening liquid are driven by said feed pressure through said pump pathways and past said output valves.

4,050,379

INKING APPARATUS

James H. Smith, Harford, and Sherman S. Kumpf, Dryden, both of N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed May 17, 1976, Ser. No. 687,288
Int. Cl.[2] B41F *1/40*
U.S. Cl. 101—327 **3 Claims**

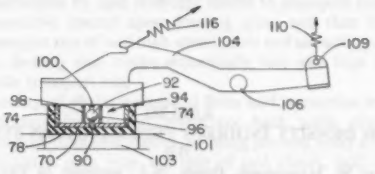
1. An inking device operable between first and second positions comprising an

elongated porous printing member having a printing surface thereon, a

backing plate member having a plurality of spaced apertures therein and in contact with said porous printing member and distal from said printing surface,

means supporting said porous printing member for operation between said first and second positions, said backing member and said supporting means defining an ink reservoir therebetween, and

means including a cylindrical member defining lengthwise



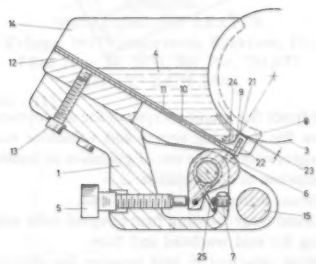
slots therein for flow of ink from said reservoir into said cylindrical member and associated with each of said apertures and spacing said plate member and said supporting means, and a circular member positioned in each of the cylindrical members and operable in relation to a respective aperture for metering ink from said reservoir to said porous printing member upon movement of said inking device from the first to the second position.

4,050,380

INK FOUNTAIN FOR PRINTING MACHINE

Wolfgang Pfizenmaier, Seeheim, Bergstr., Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany

Filed Mar. 29, 1976, Ser. No. 671,112
Claims priority, application Germany, Apr. 3, 1975, 2514509
Int. Cl.[2] B41F *31/04*
U.S. Cl. 101—365 **10 Claims**



1. Ink fountain for printing machines having a fountain chamber for receiving a supply of ink therein comprising an elongated ink knife forming the base of the fountain chamber, a rotary fountain roller forming a side of the fountain chamber, and means for zonewise adjusting the thickness of a film of ink on said fountain roller, said ink knife having a fixed end and a free end cantilevered therefrom, said free end being yieldable relative to said fixed end, said ink knife having a wiper edge adjacent to fountain roller for wiping ink therefrom, and being bent along the length thereof in direction toward said fountain roller at a location in vicinity of said wiper edge, the bent portion of said ink knife adjacent said wiper edge having an end face opposite to said fountain roller, said adjusting means underlying said yieldable free end of said ink knife and coacting therewith for adjusting the spacing of said end face relative to said fountain roller, said bent ink knife also having a wiper surface adjacent said wiper edge and partly defining the interior of said fountain chamber, said wiper surface being disposed at an angle larger than an acute angle to said fountain roller and

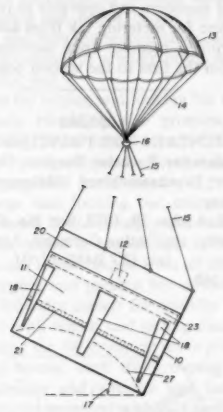
being streamlined for facilitating a return flow to said interior of said fountain chamber of the ink wiped from said fountain roller.

4,050,381

LOW DENSITY INDIRECT FIRE MUNITION SYSTEM (U)

Robert W. Heinemann, Dover, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 12, 1972, Ser. No. 246,090
Int. Cl.[2] F42B *25/02*
U.S. Cl. 102—4 **6 Claims**



1. An indirect fire munition system for deployment from the atmosphere for defeating armor and vehicular military type ground targets without the use of guidance or homing devices, which comprises in combination:

a directional firing explosive warhead,

a directional target sensing fuze coupled with said warhead;

a housing for said warhead and fuze;

a parachute attached to said housing for retarding the descent of the munition on deployment; and

vane means for inducing rotation of said housing during descent; wherein

said fuze comprises an electric detonator coupled to a directional electronic sensing system containing a detector element, which is responsive to a characteristic signature of such a military target but is unresponsive to background and nonmilitary type targets, and which on detecting a military type target generates an output voltage which functions the electric detonator and explodes the warhead;

said warhead comprises a projectile and an explosive propellant for directionally propelling said projectile at the target in alignment with the viewing axis of said directional sensing system; and

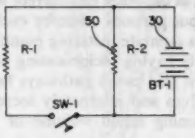
said vane means is adapted to induce rotation of said housing by aerodynamic forces at a predetermined rate during descent and thereby cause the directional sensing element to scan the ground along a spiral path.

4,050,382

ELECTRICALLY DETONATED EXPLOSIVE DEVICE

John M. Power, Hull, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Canada

Filed July 22, 1976, Ser. No. 707,658
Claims priority, application Canada, Aug. 18, 1975, 233671
Int. Cl.[2] F42C *3/00*
U.S. Cl. 102—16 **3 Claims**



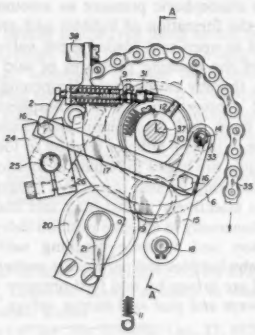
1. An electrical circuit for use in detonating an explosive device under water said circuit comprising a battery, a water pressure operated switch, an electric blasting cap wired in series with said switch and said battery and a resistor of selected value connected across terminals of said battery whereby decay of said battery takes place as soon as said battery is activated by salt water so that if said explosive device fails to detonate at its operating depth, on closing of contacts of said pressure switch, said battery will have less than a minimum voltage required to detonate the device within a selected time period after the firing should have taken place.

4,050,383

ARRANGEMENT FOR GENERATING A ROCKING MOTION OF A TRANSFER CYLINDER OF AN INKING SYSTEM

Karel Hynst, Adamov, Czechoslovakia, assignor to Adamovske strojirny, narodni podnik, Adamov, Czechoslovakia

Filed June 16, 1976, Ser. No. 696,636
Claims priority, application Czechoslovakia, June 23, 1975, 4403/75
Int. Cl.[2] B41F *31/14*
U.S. Cl. 101—349 **4 Claims**



1. Arrangement for generating a rocking motion of a transfer cylinder of an inking system derived from an intermittent motion of a ductor cylinder, in a printing machine, comprising a transfer cylinder with a shaft, a supporting rod pivotably supported in a side wall of the printing machine, holders fixed on this supporting rod rotatably supporting the transfer cylinder, a ductor cylinder on a shaft, a chain wheel rotatably supported on the ductor cylinder shaft, a connecting bolt rotatably supported on this chain wheel, a first pawl and a second pawl fixed on this connecting bolt, a thumb provided on the first pawl, a stable first cam fixed on the shaft of the

ductor cylinder, a supporting sleeve with an adjustable second cam rotatably supported on the shaft of the ductor cylinder, the thumb on the first pawl adapted to bear alternately on the working surface of the first and second cam, a first ratchet wheel fixed on the shaft of the ductor cylinder, the first pawl adapted for selective engagement with this first ratchet wheel, a second ratchet wheel rotatably supported on the shaft of the ductor cylinder, the second pawl adapted for selective engagement with this second ratchet wheel, a cam track provided on the hub of the second ratchet wheel, a stable supporting bolt rockingly supporting a first control lever, a roller rotatably arranged on this first control lever, this roller bearing against the cam track on the hub of the second ratchet wheel.

4,050,384

TUBE INSPECTION AND SERVICING APPARATUS

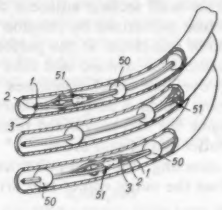
John Edward Chapman, London, England, assignor to Babcock & Wilcox Limited, London, England

Filed Sept. 4, 1975, Ser. No. 610,237

Claims priority, application United Kingdom, Sept. 9, 1974, 39317/74

Int. Cl.² B61B *13/10*

U.S. Cl. 104—138 G **4 Claims**



1. An apparatus for conveying a device for inspecting or performing operations on the interior of a tube wall together with a trailing length of connecting lead along the bore of a tube which apparatus includes the connecting lead for the device and a plurality of traction units secured at spaced locations along said lead, each traction unit including an electric motor connected through a reduction gear train to one or more drive means, and biasing means adapted to urge one or more of the drive means into frictional driving contact with the internal tube wall, electrical leads for supplying power to said traction units from an external source, and said traction units being electrically connected in parallel to said electrical leads for supplying power to said units.

4,050,385

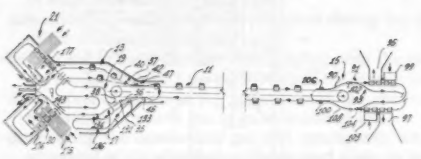
HIGH CAPACITY PASSENGER TRANSPORT APPARATUS

Robert H. Gurr, Los Angeles, and Roger E. Broggie, Carmel, both of Calif., assignors to Walt Disney Productions, Burbank, Calif.

Filed Sept. 29, 1975, Ser. No. 617,437

Int. Cl.² B61B *11/00*

U.S. Cl. 104—173 ST **13 Claims**



1. High capacity passenger transport apparatus comprising:

endless high speed cable means including a cable running from a loading to an unloading station and having transport and return runs and means for driving it at high speed;

intercept means for intercepting trucks from said return run;

a plurality of chair trucks including releasable gripper means for selectively gripping said high speed cable and, truck support means;

a plurality of loading station shuttle tracks at said loading station for receiving truck support means of said trucks intercepted by said intercept means to transport them to respective spaced apart loading areas and then to the transport run of said high speed cable and including means for feeding said trucks sequentially into said high speed cable transport run;

a plurality of chairs suspended from said respective trucks, including frames and respective back walls pivotally mounted from said frames for being pivoted away to clear a through path from the rear of said chairs, said chairs further including seats mounted from said walls;

gripper release means for engaging said releasable grippers to release said grippers from said high speed cable as said trucks feed onto said respective shuttle tracks;

gripper actuation means to activate said grippers as said trucks are fed onto said transport run;

selector means for intercepting chair trucks from said high speed cable and directing them sequentially onto each shuttle track of said plurality of shuttle tracks; and

loading escort means for engaging said trucks as they are received on said shuttle tracks, advancing said trucks along said shuttle tracks at a relatively low speed to said respective loading areas and then back to said transport run of said high speed cable to feed said trucks sequentially from each shuttle track of said plurality onto said high speed cable means whereby said high speed cable may be run at a higher speed than said shuttle drive means and said trucks may be fed sequentially from the shuttle tracks onto said cable means to position the suspended chairs in spaced relationship on said cable for advancement thereof with said high speed cable means.

4,050,386

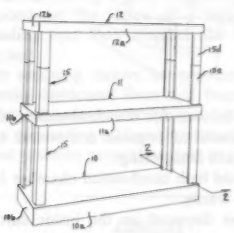
SHELVING APPARATUS

Harlan F. Kellogg, 1617 Sprucewood, Rockford, Ill. 61107

Filed June 30, 1976, Ser. No. 701,072

Int. Cl.² A47B *3/00*

U.S. Cl. 108—111 **12 Claims**



1. In a free-standing shelving apparatus including a plurality of shelves of polygonal configuration disposed in vertically spaced relation and a plurality of uprights extending between each shelf and the next lower shelf, the improvement comprising said uprights each including a solid core having a multi-sided configuration and panel members adhesively joined to each of the side faces of the core, one end of the core being spaced axially outwardly from one end of the panel members to provide a multi-sided tongue at one end of each upright and the other end of the core being spaced axially inwardly of the other end of the panel members to provide a multi-sided socket at the other end of each upright dimensioned to non-rotatably receive the tongue on an axially aligned upright, at least some

of said shelves having openings adjacent each corner thereof inwardly of the periphery of the shelf for receiving the tongues on the uprights, and said tongues having a length to extend through said openings in the shelves and into the socket in an axially aligned upright.

4,050,387

FLUID INDUSTRIAL WASTE INCINERATOR AND ITS METHOD OF OPERATION

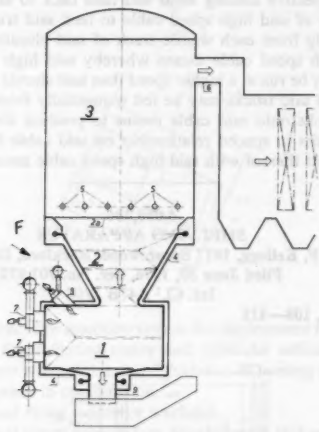
Peter Luchsinger, Zurich, Switzerland; Heribert Muckenheim, Offenbach, Germany; Hanns-Helmut Riemann, Bochum-Querenburg, Germany; Hans Sonnenschein, and Erich Michel, both of Essen, Germany, assignors to Von Roll AG, Switzerland and Gelsenberg Mannesmann Umweltschutz GmbH, Germany

Filed Mar. 17, 1976, Ser. No. 667,592

Claims priority, application Switzerland, Mar. 18, 1975, 3434/75

Int. Cl.[2] F23G *5/12*; F22B *33/00*

U.S. Cl. 110—8 A **12 Claims**



1. A liquid bath furnace for the combustion of pumpable, fluent waste comprised of organic compound and mineral substance, said furnace comprising:

a primary hot liquid bath combustion chamber for the combustion of said waste;

wall-cooling tubes disposed on the inside surface of said chamber;

a corrosive-inhibiting, heat conductive ramming mass cladded to said wall-cooling tubes to thereby provide an inner chamber surface within said primary combustion chamber that is maintainable at a temperature below the melting temperature of said mineral substance in said waste;

a secondary combustion chamber connected downstream of said primary combustion chamber for the combustion of gaseous products from said primary combustion chamber; and

a post-combustion chamber connected downstream of said secondary combustion chamber for the combustion of gaseous products from said secondary combustion chamber.

4,050,388

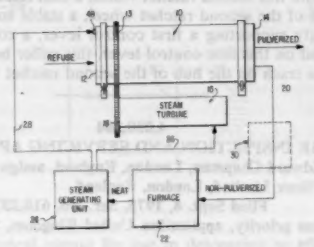
REFUSE TREATMENT APPARATUS

John A. Boyd, 4500 S. Four Mile Run Drive, Arlington, Va. 22204

Filed Sept. 9, 1976, Ser. No. 721,698

Int. Cl.[2] F23G *7/00*

U.S. Cl. 110—8 P **7 Claims**



1. In an apparatus for treatment of refuse, which apparatus includes a rotatable drum having an inlet end and an outlet end, a perforated drum wall section adjacent the outlet end for separation of refuse pulverized by rotation of the drum, and vane means within said drum at the perforated wall section which direct refuse back toward said inlet end as said drum rotates, the improvement which comprises:

a furnace means which is adapted to burn and at least partially consume the non-pulverized refuse which emerges from the outlet end of said drum;

means for directing the non-pulverized refuse which emerges from the outlet end of said drum to said furnace means;

steam generating means coupled with said furnace means to produce a supply of steam in response to heat supplied by said furnace means;

steam turbine means connected with said drum to cause rotation of said drum; and

means for directing at least a portion of said steam supply to said steam turbine means to power the same.

4,050,389

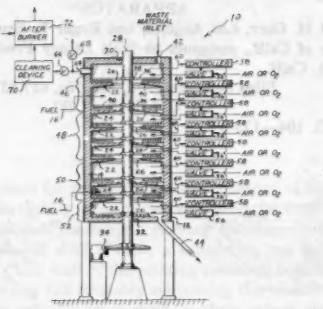
METHOD AND APPARATUS FOR INCINERATING WASTE MATERIAL

Charles F. von Dreusche, Jr., Ramsey, N.J., assignor to Nichols Engineering & Research Corporation, Belle Mead, N.J.

Filed July 19, 1976, Ser. No. 706,637

Int. Cl.[2] F23G *5/04*; F27B *9/22*

U.S. Cl. 110—12 **15 Claims**



1. In a multiple hearth furnace having a plurality of vertically spaced hearths, wherein waste material is introduced to the furnace at the top thereof and moves downwardly in a

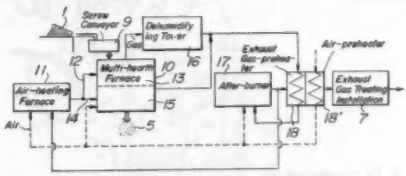
generally serpentine fashion moving alternatively inwardly and outwardly across the hearths and is discharged at the bottom of the furnace, a method comprising the steps of introducing towards the lowermost hearth thereof air in a quantity less than that theoretically required for complete combustion of the material being processed, thereafter at successively higher hearths ascertaining the temperature at each hearth and adding air thereto in quantities only sufficient to support combustion thereon, and on each hearth in the middle portion of said furnace adding only enough air to each hearth as to maintain the temperature on that hearth under a maximum predetermined limit, and thence discharging exhause gases at the top of said furnace.

8. Apparatus for incinerating waste material comprising, in combination, a multiple hearth furnace having a plurality of vertically spaced hearths, a rotatable center shaft extending through the center of the furnace and passing through each hearth, a plurality of spaced rabble arms secured to the center shaft and extending radially outwardly over each hearth, alternate hearths having drop holes disposed towards the center shaft and the other hearths having drop holes disposed toward the outer periphery thereof, said furnace having an upper material inlet and a lower material dispensing outlet, and said furnace having an upper exhaust gas outlet, means for introducing towards the lowermost hearth thereof air in a quantity less than that theoretically required for complete combustion of the material being processed, means disposed on successively higher hearths for ascertaining the temperature at each hearth and means for adding air thereto in quantities only sufficient to support combustion thereon, means disposed on each hearth in the middle portion of the furnace for adding only enough air to each hearth to maintain the temperature on that hearth under a predetermined maximum limit.

4,050,390
METHOD OF TREATING SEWAGE SLUDGE

Shinichi Hara, Handa, and Taro Kato, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Aug. 30, 1976, Ser. No. 718,559
Claims priority, application Japan, Sept. 18, 1975, 50-112064
Int. Cl.[2] F23G *5/12*
U.S. Cl. 110—15 **2 Claims**

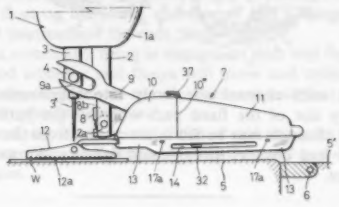


1. A method of treating sewage sludge comprising
drying sewage sludge in an upper part of a multi-hearth furnace,
subjecting the sewage sludge to pyrolyzation in a lower part thereof to cause it to reduce to ashes,
extracting from the multi-hearth furnace both exhaust gas produced during the drying of the sewage sludge and the exhaust gas produced during the pyrolyzing independent of each other,
dehumidifying the exhaust gas produced during the drying of the sewage sludge,
mixing the exhaust gas thus dehumidified with the exhaust gas produced during the pyrolyzing of the sewage sludge,
adding preheated gas to the mixed exhaust gas and burning the preheated mixed gas in an after-burner and
discharging the combustion gas into atmospheric air, heat generated in the after-burner being used again to preheat gas to be fed into the after-burner and to an air-heating furnace and preheat the exhaust gas to be fed into the after-burner and a part of the exhaust gas burned in the after-burner together with the preheated air being heated in the air-heating furnace and then fed into the multi-hearth furnace.

4,050,391
BUTTONHOLE STITCHING DEVICE FOR ZIGZAG SEWING MACHINE

Katsuji Mori, 12-2, Chidori-cho 3-chome, Ogaki, Gifu, Japan

Filed Mar. 8, 1976, Ser. No. 664,855
Claims priority, application Japan, Mar. 12, 1975, 50-30476
Int. Cl.[2] D05B *3/24*
U.S. Cl. 112—77 **4 Claims**



1. A buttonhole stitching device to be attached to a zigzag sewing machine, the bottonhole stitching device comprising:
a forked member consisting of a forked front portion forming a long notch and a rear portion provided with an upstanding shroud frame wall defining a nearly recatangular aperture, said long notch having a width which corresponds to an amplitude of a laterally moving sewing machine needle;
a base plate, said forked member in facing contact with said base plate for sliding movement relative thereto, said base plate having guide hook means at its front edge which extends into said notch of said forked member for guiding said forked member in reciprocating and swinging movement;
a rotative axis to which a pinion is fixed at the upper portion thereof, said axis penetrating the central portion of said base plate;
driving means attached to said rotative axis beneath said base plate so as to rotate said axis in cooperation with the up-and-down movement of said sewing machine needle;
a cam plate removably fitted into said walled aperture, said cam plate including a loop channel, the shape of which corresponds to the shape of a buttonhole, and a rack surrounding said loop channel and engaging with said pinion; and
cam plate retaining means for preventing said cam plate from being dislocated from said framed aperture of said forked member and selectively movable between a first position preventing said movement of said cam plate and a second position permitting said movement of said cam plate.

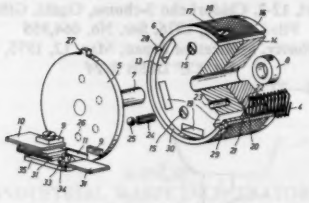
4,050,392
BUTTON SELECTOR FEED FOR A BUTTON SEWING MACHINE

Hermann Taddicken, Schwabisch Gmund, Germany, assignor to Eisele Apparate-und Geratebau GmbH, Germany

Filed July 22, 1976, Ser. No. 707,506
Claims priority, application Germany, Dec. 2, 1975, 7538335[U]
Int. Cl.[2] D05B *3/22*
U.S. Cl. 112—113 **4 Claims**

1. A button selector feed for a button sewing machine having a button clamp plate with a feed slot and a driver having a button engagement means movable along the feed slot with a selected button, comprising a button selector mounted on the clamp plate adjacent the feed slot and having a fixed part with

a button delivery slot adjacent the feed slot, and a movable part movable relative to said fixed part having a plurality of button feed channels defined therein and accommondating distinctive buttons in respective channels, and means mounting said movable part for movement relative to said fixed part so as to



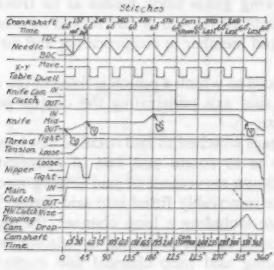
present each channel selectively into alignement with the delivery slot of the fixed part whereby the buttons in the aligned channels may be fed in succession from the associated aligned feed channel through said delivery slot and into the feed slot.

4,050,393

METHOD AND APPARATUS FOR CONTROLLING AN AUTOMATIC BAR TACKING MACHINE

Ray E. Welcher, Danvers, and Roger E. Lemay, Beverly, both of Mass., assignors to USM Corporation, Boston, Mass.

Filed Sept. 29, 1975, Ser. No. 617,445
Int. Cl.[2] D05B *21/00*
U.S. Cl. 112—121.12 **3 Claims**



1. In a bar tacking sewing machine having a needle bar drive shaft operatively connected through a clutch to a motor to provide reciprocating motion to a needle, and a workpiece clamp constructed to releasably secure and support a workpiece under the needle, said clamp being slidably and pivotably mounted on the sewing machine for movement relative to the needle along first and second axes, said movement being driven by stepping motors which are operatively connected to the clamp through a non-linear linkage assembly, a method for controlling the stepping motors to provide movement of the workpiece through a predetermined pattern comprising:

A. digitizing the pattern to provide a point by point definition of the path of the workpiece movement;

B. modifying the digitized pattern to compensate for the non-linearity of the clamp drive linkage assembly;

C. coding a Programmable Read Only Memory with the modified digitized pattern;

D. reading the Programmable Read Only Memory by the generation of delayed enabling signals transmitted to said Memory at intervals within the period of needle retraction;

E. generating a train of drive pulses according to the coded digitized pattern;

F. counting each rotation of the needle bar drive shaft and generating timing pulses according thereto; and

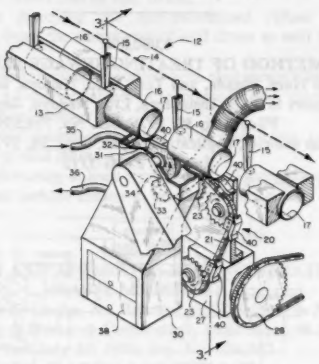
G. transmitting the drive pulses to the stepping motors in times relation to the timing pulses.

4,050,394

CAN FABRICATION SYSTEM

Raymond J. Alleman, Evergreen Park; Raymond T. Batina, Homewood, and Ralph J. Clark, Tinley Park, all of Ill., assignors to Libby, McNeil & Libby, Worth, Ill.

Filed Apr. 9, 1976, Ser. No. 675,276
Int. Cl.[2] B21D *51/26*; B23K *3/00*
U.S. Cl. 113—120 R **12 Claims**



1. In combination:

an article of manufacture for shielding the interior of one of a succession of container bodies from impurities present during the fabrication thereof comprising base means and a substantially U-shaped first impurity deflection member having a pair of arms and an intermediate portion defining a transition edge, extending from said base means;

means for wiping the exterior of said container bodies;

means for moving said transition edge of said impurity deflection member in close predetermined spaced relation with an edge defining a forward open end of said one of said succession of container bodies thereby defining an air gap between said transition edge and said edge defining said forward open end; and

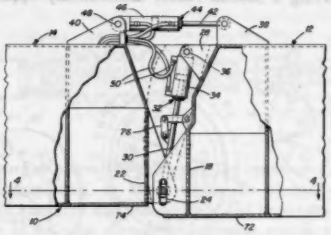
means for moving said succession of container bodies so that said wiping means can be guided from said transition edge over said air gap onto said one of said container bodies without substantial contact with said edge defining said forward open end, whereby said article of manufacture prevents impurities from passing into said one of said container bodies with minimal application of force thereto.

4,050,395

ARTICULATED HULL CONSTRUCTION

Thomas M. Anderson, P. O. Box 2593, Kodiak, Alaska 99615

Filed Mar. 29, 1976, Ser. No. 671,364
Int. Cl.[2] B63B *3/02*
U.S. Cl. 114—77 R 11 Claims



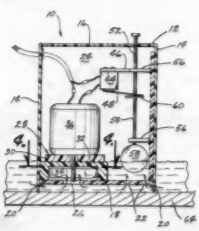
1. In combination, a boat hull including fore and aft hull sections, pivot means pivotally interconnecting said sections for relative angular displacement of said sections about a horizontal transverse axis between predetermined limits, and connecting means interconnected between said sections remote from said pivot means operative to adjustably yieldingly resist relative angular displacement of the hull sections, said pivot means including adjustment means for adjustably vertically shifting one of said sections and said axis relative to the other of said sections.

4,050,396

PORTABLE WATER BAILING DEVICE FOR A BOAT

Rex L. Ridgeway, 1301 S. D St., Fairfield, Iowa 52556

Continuation of Ser. No. 537,333, Dec. 30, 1974, Pat. No. 3,941,073. This application Mar. 2, 1976, Ser. No. 663,082
The portion of the term of this patent subsequent to Mar. 6, 1993, has been disclaimed.
Int. Cl.[2] F04B *49/04*
U.S. Cl. 114—183 R 1 Claim



1. A portable water bailing device for a boat having a bottom wall and gunwales above said bottom wall, said device comprising; a housing having sidewalls, a top wall and a bottom wall forming

a compartment, said bottom wall being spaced upwardly from the lower edges of said sidewalls, said lower edges of said sidewalls being provided with a plurality of apertures therein positioned below said bottom wall;

a water pump mounted within said housing, said water pump having a cylindrical chamber therein with an inlet opening and an outlet opening, said outlet opening extending tangentially outwardly from the cylindrical wall of said cylindrical chamber;

said housing having at least one opening at the lower end thereof for permitting water to enter said compartment;

a flat blade being rotatably mounted within said cylindrical chamber of said pump for rotation about the cylindrical axis of said chamber;

a direct current motor drivingly connected to said blade;

a limit switch within said compartment and movable between open and closed positions, said limit switch being normally biased toward to its open position;

said limit switch having a switch arm thereon which is movable upwardly to cause said switch to move to said closed position;

a direct current power source connected in series with said limit switch and said direct current motor;

float means movably mounted within said compartment for vertical movement from a lower position to an upper position;

said float means comprising a vertically extending rod having a float on the lower end thereof and a flange positioned intermediate the ends thereof;

said limit switch arm being in engagment with said flange of said rod whereby said flange will move said switch arm upwardly to close said switch whenever said float moves to said upper position; and

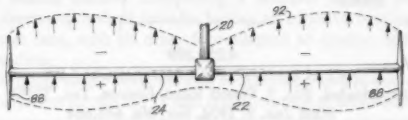
tube means connected to said outlet of said pump for directing water from said pump upwardly over said gunwales of said boat.

4,050,397

FOIL FENCE FOR HYDROFOIL CRAFT

Siebold Vanderleest, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 26, 1976, Ser. No. 680,627
Int. Cl.[2] B63B *1/24*
U.S. Cl. 114—274 14 Claims



1. A vortex control means fora a hydrofoil craft lifting foil arranged to generate lift when moved horizontally through water, the foil having an outboard tip with a predetermined chord length, said vortex control means being attached to the foil tip and comprising:

a streamline fence extending completely along said chord length and generally vertically below said foil, the fence having an outboard surface convexly curved over substantially its entire length in the chordwise direction of the foil, and with the line of intersection of the outboard surface with any plane extending vertically normal to the chordal plane of the foil and extending parallel to the spanwise axis off the foil being a substantially straight line, a substantially planar inboard surface, a chordwise dimension corresponding to the chord length of said outboard tip of said foil, and a maximum vertical dimension as measured from the foil chord corresponding generally to one half the chord length of said outboard tip of said foil.

4,050,398

PONTOON BOAT GUIDANCE SYSTEM

Carl F. Holliday, Las Vegas, Nev., assignor to Holliday Guidance Systems, Inc., Las Vegas, Nev.

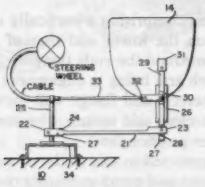
Filed May 14, 1976, Ser. No. 686,461
Int. Cl.[2] B63H *5/13*
U.S. Cl. 115—18 R 1 Claim

1. An improvement to a guidance system used in a pontoon boat which is powered by an outboard motor wherein the guidance system includes:

a. a steering wheel mechanically coupled and mounted to the pontoon boat;

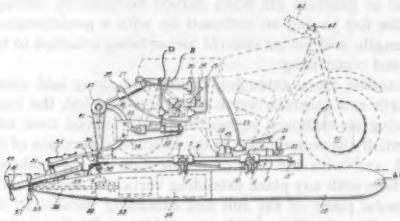
b. a push-pull cable mechanically coupled to the steering wheel and operated in response to movement thereof;

c. a push-pull cable mounting mechanically coupled to the push-pull cable and rigidly mounted to the pontoon boat;
d. an outboard motor having a lever arm disposed a particular distance from its vertical axis; and
e. a base rigidly mounted to the pontoon boat and mechanically coupled to the outboard motor, said base adapted to allow the outboard motor to pivot about its vertical axis, said improvement comprising:
a. a first member having a first U-shaped end mechanically coupled to the push-pull cable mounting and a second U-shaped end;



b. a second member having a first end mechanically coupled to said second U-shaped end and a second end, said second member also having a slot disposed between said first and second end;
c. coupling means for connecting the push-pull cable to said slot and thereby mechanically coupling said second member to the push-pull cable; and
d. connecting means for connecting said second end of said second member to the lever arm of the outboard motor.

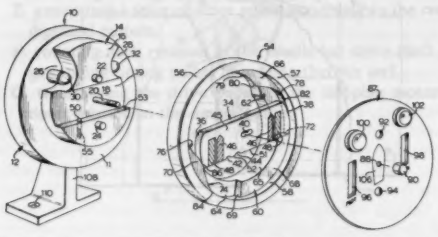
4,050,399
ATTACHMENT FOR MOTORCYCLES
Ashton Mochel, Rte. 7, Forest Road, Conroe, Tex. 77301
Filed Jan. 5, 1976, Ser. No. 646,664
Int. Cl.[2] B63H *1/00*
U.S. Cl. 115—71 **4 Claims**



1. In an attachment for motorcycles, a frame adapted to be mounted on the framework of a motorcycle, pivotal supporting arms on said frame, the extended ends of said arms supporting flotation means, a propulsion framework pivotally mounted on said motorcycle framework, having propulsion means mounted thereon, and means for selective transmission of power to said propulsion means from said motorcycle, pneumatic means mounted on said frame having conduits on said motorcycle for selectively actuating said arms and said propulsion framework.

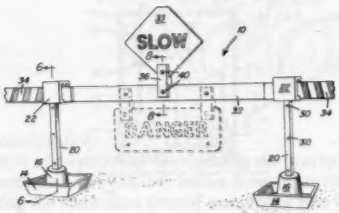
4,050,400
MARINE NAVIGATION INSTRUMENT
Nelson Tatton, Palgrove, Ontario, and James Tatton, 74 Gunn Street, Barrie, Ontario, both of Canada
Filed May 17, 1976, Ser. No. 687,367
Int. Cl.[2] B63B *45/00*
U.S. Cl. 116—26 **9 Claims**

1. A buoy for determining a navigable channel reminder comprising an indicator having spaced depictions of pairs of nun and can buoys thereon, a mounting member for supporting the indicator for lateral reciprocal movement, a frame secured to the mounting member for rotational movement of the frame, the frame having on its inner surface a first cam and the mounting member having a first recess diametrically opposed the first cam, a second cam adjacent the first recess and the mounting member having a second recess diametrically opposed the



second cam and adjacent the first cam, the distance between each cam and its diametrically opposed recess being such to accommodate the indicator, a face cover having two spaced display windows therein to alternately display nun and can buoys and can and nun buoys respectively in the windows when the frame is rotated in one direction, then the reverse direction, causing the cams to alternately move the indicator in one direction then the return direction.

4,050,401
BARRICADE SYSTEM
Henry W. Kelly, Cottage Grove, Oreg., assignor to Wanda McCullough, Felton, Calif., a part interest
Filed Dec. 22, 1975, Ser. No. 643,130
Int. Cl.[2] E01F *9/01, 9/10*
U.S. Cl. 116—63 P **21 Claims**



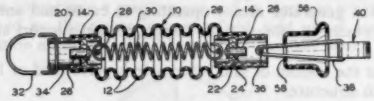
1. A barricade system comprising: means for warning traffic of a dangerous situation and to protect them therefrom including; base means having at least two easily separable and connectible units, one unit being a base pan unit with a flat bottom portion and a center portion for connection to a second unit of cone shape, both units arranged for receiving removable support means, support means mounted thereon, head means on said support means for mounting barricade devices at an easily visible height, and the base pan unit has a raised outer edge forming a pan-like structure and a raised inner cylindrical portion for supporting the cone unit, the support means comprising a support tube unit, and the head means including a double-slotted body member having mounting means at the bottom thereof for engagement with the support tube, with the double-slotted body member having a mounting socket at the bottom thereof to provide the mounting means.

4,050,402

BURGLAR ALARM FOR DOORS

Henry H. Merriman, 751 W. Washington St., Jackson, Mich. 49203

Filed July 1, 1976, Ser. No. 701,900
Int. Cl.[2] G08B 13/08
U.S. Cl. 116—86 8 Claims



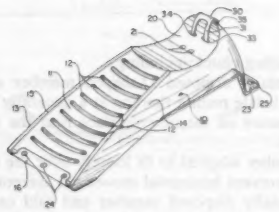
1. A burglar alarm for indicating the opening of a building closure comprising, in combination, an elongated bellows having an axis, first and second ends and expansible and contractable in its axial direction, a tension spring within said bellows having first and second ends, said first spring end being affixed to said bellows' first end and said second spring end being affixed to said bellow' second end whereby said spring biases said bellows toward its connected condition, an air passage communicating with the interior of said bellows, a vibratable read within said air passage producing an audible signal during movement of said member from the expanded condition to the contracted condition, first anchor means defined upon said first end, and second anchor means defined on said second end.

4,050,403

AUTO REPAIR RAMP WITH SIGNAL

Jack V. Miller, Sierra Madre, Calif., assignor to Acroform Corporation, Los Angeles, Calif.

Filed Aug. 20, 1975, Ser. No. 606,301
Int. Cl.[2] B66F 19/00
U.S. Cl. 116—124 R 10 Claims



1. An automobile service ramp comprising a unitary sheet metal body member including a ramp portion, a wheel rest portion and a support portion;

said ramp portion having a concave track portion having a number of transverse extending corrugations, and

a pair of integral ribs extending longitudinally with respect to said ramp portion along each side thereof;

said longitudinal ribs upstanding above the level of the transverse corrugations and said longitudinal ribs including depending extensions constituting continuations of said longitudinal ribs having a length below the neutral fiber of a cross section of the ramp portion at least three times the maximum distance of the longitudinal rib above the neutral fiber; and

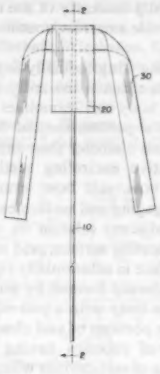
wherein said rest portion is a surface that is in the form of a portion of a sphere.

4,050,404

SURVEY MARKER

Edwin E. McMackin, 131 Yorktown, Dallas, Tex. 75208

Continuation of Ser. No. 554,188, Feb. 28, 1975, abandoned.
This application Mar. 15, 1976, Ser. No. 666,759
Int. Cl.[2] G01C 15/06
U.S. Cl. 116—124 R 8 Claims



1. A survey marker comprising, in combination

a stake comprising an elongated small-gauge metal rod, having a sufficient stiffness to be driven into the ground;

an indicia member comprising a laminate of two pliant sheets, each sheet initially having an adhesive coating on one face, with its other face adapted to receive written indicia;

said pliant sheets being bonded to each other and to said rod, adjacent to one end of said rod, by means of said adhesive coatings; said rod being disposed between said bonded sheets, generally centrally of opposite edges thereof;

an elongated ribbon secured to said indicia member, having a portion passing transversely between said laminated sheets and secured by means of the adhesive thereon; and said ribbon extending for a substantial length in at least one direction from the edge of said indicia member;

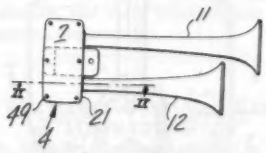
and said laminated indicia member providing a relatively firm surface capable of receiving written indicia.

4,050,405

SINGLE-HOUSING MULTI-TRUMPET AIR HORN

Walter C. Palm, Grand Rapids, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Mar. 29, 1976, Ser. No. 671,593
Int. Cl.[2] G10K 9/04
U.S. Cl. 116—142 FP 8 Claims



1. A multiple-trumpet air horn comprising:

a housing comprising a body and a cap defining a plurality of laterally spaced air pressure chambers, each centered with respect to an axis in parallel relation with the axes of the other chambers and extending generally perpendicularly to mutually-facing planate face surfaces of the cap and the body;

a diaphragm for each chamber adapted to be peripherally confined between said body and said cap;

said body defining portions of said chambers in the form of a cavity for each chamber spaced one from the other, each cavity extending inwardly from said face surface of the body and being perimetrically defined by a continuous rabbet extending axially inwardly from said face surface and then laterally inwardly of the cavity toward the axis thereof to provide a narrow continuous perimetric seating surface;

said body defining longitudinally-angled air escape ducts, each of which extends inwardly from an outer lateral surface of the body and terminates centrally inwardly of said cavity in a portion formed by an annular boss of substantially less diameter than any transverse dimension of the respective encircling seating surface extending through said boss, said boss terminating in an annular diaphragm-engaging end surface extending within a plane and parallel adjacent relation to, or within, the general plane of said seating surface, said air ducts terminating at said outer surface in substantially right angle relation with the portions thereof formed by said bosses in means for connecting the body with a pair of horn trumpets;

said cap defining portions of said chambers as a corresponding plurality of recesses having perimeters generally matching those of said cavities when the cap is operatively positioned on said body, each of said recesses being peripherally bounded by a continuous ridge of a height beyond said face surface of the cap at least equal to the depth of the rabbet of the respective opposed cavity, said ridge being shaped complementary to said seating surface of the rabbet for continuously engaging the entire peripheral edge of one of said diaphragms confined therebetween, each of said diaphragms being thereby confined in central engagement with one of said bosses in a condition of resilient deformation;

duct means extending within said body from an exterior surface to portions of each cavity radially outwardly of said boss therein for supplying air to the cavities; and

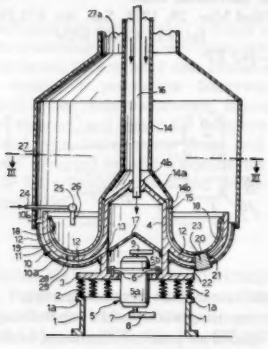
fastening means for securing said cap to the body to affect sealing of all chambers along junctures of the diaphragms, cap ridges, and body seating surfaces of said chambers.

4,050,406

COATING MACHINE FOR CONFECTIONERY, PHARMACEUTICALS AND SIMILAR PRODUCTS

Mario Reni, Brugherio (Milan), Italy, assignor to Reni-Cirillo S.r.l., Milan, Italy

Filed June 3, 1976, Ser. No. 692,527
Int. Cl.² B05C *5/00*
U.S. Cl. 118—19 **4 Claims**



1. A machine for coating articles of confectionery, or pharmaceutical or like products, said machine comprising:

a support structure;

an annular receptacle having a bottom and an upwardly open channel section;

means defining a closable discharge aperture in one wall of said receptacle, said closable discharge aperture serving, when open, for the discharge of articles from said annular receptacle;

resilient suspension means interconnecting said annular receptacle and said support structure;

vibration generator means operating to cause said annular receptacle to vibrate with respect to said support structure;

at least the bottom of said receptacle is perforated or has a mesh structure;

a container surrounding and locating the said annular receptacle such that there is a space between said bottom of said receptacle and said container;

an air duct communicating with said space between said bottom of said receptacle and said container; and

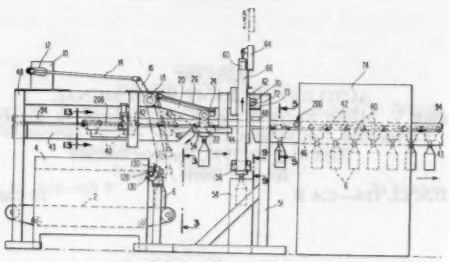
a source of air under pressure connected to said air duct, whereby in use of said machine air can be blown into said space between said perforated or mesh structure bottom of said receptacle and said container.

4,050,407

APPARATUS FOR FLUID BED COATING OF GLASS BOTTLES

George Garwood, Wynnewood, Pa., and Joseph C. Flynn, Millville, N.J., assignors to Wheaton Industries, Millville, N.J.

Filed Dec. 8, 1975, Ser. No. 638,679
Int. Cl.² B05C *3/10*
U.S. Cl. 118—58 **37 Claims**



1. Bottle holding chuck including

1. a horizontally disposed U-shaped member adapted to support a bottle resting thereon at a generally horizontal surface feature on the outer surface near the top of said bottle and

2. a cap member adapted to fit loosely over the top of said bottle to prevent horizontal movement thereof

said horizontally disposed member and said cap member being cooperatively arranged and adapted to carry a bottle positively positioned thereon and suspended therefrom with substantially all of said bottle below said surface feature free of contact with any part of said chuck.

4,050,408

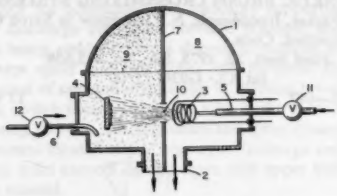
APPARATUS FOR DEPOSITING THIN LAYERS OF MATERIALS BY REACTIVE SPRAYING IN A HIGH-FREQUENCY INDUCTIVE PLASMA

Pierre Beucherie, Biandronno (Varese), Italy, assignor to European Atomic Energy Community (EURATOM), Kirchberg, Luxembourg

Filed Nov. 19, 1975, Ser. No. 633,263
Claims priority, application Luxembourg, Nov. 22, 1974, 71343
Int. Cl.² C23C *13/12*; B23K *5/00*
U.S. Cl. 118—49.1 **9 Claims**

1. An apparatus for depositing thin layers by reactive spray-

ing a high frequency inductive plasma comprising a sealing-tight vessel connected to a vacuum generation system containing means which are adapted to produce a high-frequency electromagnetic field and comprise a material which can be sprayed by the field, at least one surface serving as a substrate for the thin layer deposition, means for injecting gas into the vessel near the surface and means for injecting a gas into the vessel near the means applying the electromagnetic field, the gases comprising a reactive gas and an inert gas which can be ionized by the electromagnetic field, said vessel comprising partition means dividing it into a first chamber which contains



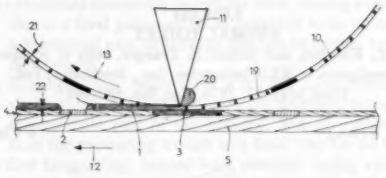
the means applying the electromagnetic field and is connected to the means supplying an ionizable inert gas and at least a second chamber which contains the substrate or substrates and is connected to the means for supplying reactive gas, the partition means being formed with an aperture which connects the chambers and is disposed on the straight path between the substrates and the means for applying the electromagnetic field, the vessel being provided with connecting ducts to the vacuum generation system, the ducts being so disposed with respect to the chambers that the reactive gas cannot flow into the first chamber.

4,050,409

CYLINDER FOR REPRODUCING RAISED PATTERNS ON ALL SURFACES

Alain Duchenaud, and Roger Duchenaud, both of 3 rue de Funas, Bourgoin Jallieu (Isere), France

Filed Oct. 7, 1974, Ser. No. 512,725
Claims priority, application France, Oct. 24, 1973, 73.38567
Int. Cl.² B05C *1/16*
U.S. Cl. 118—406 **12 Claims**



1. An apparatus for imparting relief to a pattern on a surface, comprising, in combination:

a first cylinder, containing a doctor therein, for selectively depositing on said surface a first predetermined pattern of a first flowable material having a first color;

a second cylinder, containing a doctor therein, for selectively depositing a second predetermined pattern, which is different than said first predetermined pattern, of a second flowable material having a second color which is different than said first color;

a third cylinder, containing a doctor therein, for selectively depositing a third predetermined pattern, which is different than said first predetermined pattern, of a flowable material having a third color which is different than said first color; and

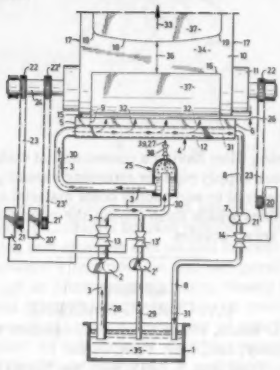
a fourth cylinder, containing a doctor therein, for selectively depositing a fourth predetermined pattern, which is different than said first predetermined pattern, of a substantially thick layer of said flowable material on only those preselected portions of said patterns which are to be raised.

4,050,410

APPARATUS FOR THE MANUFACTURE OF A SERIES OF PHOTOCONDUCTOR WEBS

Joachim Stroszynski, Naurod, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Wiesbaden, Germany

Filed May 25, 1976, Ser. No. 689,869
[62] Division Of Serial No. 584,692, June 6, 1975, Now Pat No. 3,973,961
Claims priority, application Germany, June 7, 1974, 2427515
Int. Cl.² G03G *5/04;* B05C *3/02, 5/02*
U.S. Cl. 118—410 **4 Claims**



1. An apparatus for the manufacture of a series of photoconductor webs spaced apart from each other on a carrier web by electrically conductive spacing strips extending transversely to the carrier web, comprising

a. a movable backing member for supporting and transporting said carrier web;

b. a slot die extending parallel to said backing member and having an orifice located directly contiguous said backing member;

c. means positioned at one front edge of said slot die for supplying a photoconductive coating solution to said slot die, said supplying means including at least one first infinitely variable dosing pump and at least one valve positioned between each first dosing pump and said slot die, said valve being capable of operating without causing displacement; and

d. means positioned at the front edge of said slot die opposite to said supplying means for discharging excess coating solution from said slot die, said discharging means including a second infinitely variable dosing pump and a valve positioned on the side of said second dosing pump opposite said slot die, said valve being capable of operating without causing displacement.

4,050,411

APPARATUS FOR MARKING INSULATED ELECTRICAL CONDUCTORS

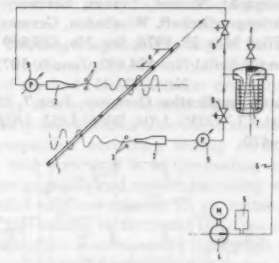
Klaus Kimmich, Stuttgart, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 30, 1976, Ser. No. 682,301
Claims priority, application Germany, May 14, 1976, 2521529
Int. Cl.² B05B *5/00*
U.S. Cl. 118—625 **4 Claims**

1. Improvements in apparatus for marking insulated electrical conductors with a stream of color material continuously emerging under pressure from a spray nozzle disposed with respect to an electrical conductor, which stream is deflected

under the action of an electrical alternating field, said stream of color material being supplied by supply means for said color material including a supply pipe leading from said supply of color material to said nozzles, said improvement comprising:

insertion of a straining filter having an opening at its highest point positioned in said pipe leading from said supply of color material to said spray nozzles; and



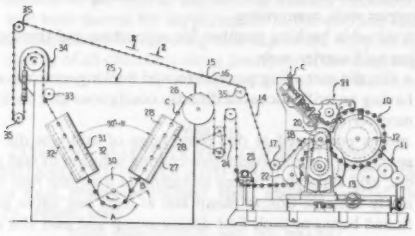
said straining filter having a connection at said highest point to a return supply pipe for returning a small portion of said color material to said supply color material along with any gas bubbles which form during the course of said supply to said spray nozzles.

4,050,412

U.V. CURING MACHINE

Frederick H. Bautz, Hazel Crest, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Jan. 9, 1975, Ser. No. 539,837
Int. Cl.[2] B05C *13/02*
U.S. Cl. 118—642 **19 Claims**



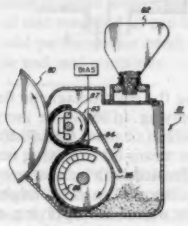
12. An ultra-violet curing machine for curing the exterior surface of can bodies coated with photopolymerizable ink, said curing machine comprising; a conveyor chain, pins mounted at spaced intervals along said conveyor chain and extending laterally from said conveyor chain whereby said pins each may receive a can body for supporting can bodies on said pins, a first expanse of conveyor chain, first and second ultra-violet lamps mounted on opposite sides of the plane of said first expanse of conveyor chain and said pins for applying radiant energy to first and second opposed side areas of can bodies, a sprocket for accommodating said conveyor chain around it and changing the direction of movement of said conveyor chain, a section of conveyor chain extending from said first expanse of conveyor and around part of said sprocket, a second expanse of said conveyor chain extending from said section of conveyor chain and in a direction relative to said first expanse of conveyor chain so that the direction of the conveyor chain is altered by an angular amount to rotate said can bodies through an angle of ninety degrees about their axes relative to their positions in said first expanse of said conveyor chain, and third and fourth ultra-violet lamps mounted on opposite sides of the plane of said second expanse of conveyor chain for receiving can bodies in their newly rotated positions and said pins for applying radiant energy to third and fourth side areas of said can bodies whereby said third and fourth ultra-violet lamps apply radiant energy to can body side areas rotated at 90° from the can body exposed to said first and second ultra-violet lamps, and all exterior portions of the curved areas of said can bodies are exposed to about the same intensity of radiant energy so that curing of the photopolymerizable ink on said exterior surface of said can bodies is effected.

4,050,413

MAGNETIC BRUSH CROSSMIXING SYSTEM

Delmer G. Parker, Irondequoit, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 22, 1975, Ser. No. 615,658
Int. Cl.[2] G03G *13/00*
U.S. Cl. 118—647 **17 Claims**



1. In a system for developing latent images carried by an imaging surface including multiple donor members adjacent said imaging surface which carry developer particles through a development zone to said imaging surface to develop the latent image, the improvement comprising:

a homogenizing means interposed between at least two adjacent donor members for homogenizing developer particles being carried between said donor members, and

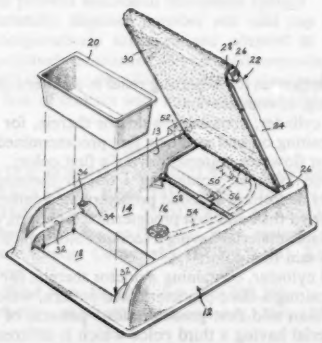
an oscillating means connected to said homogenizing means which mixes the developer as it flows through the development zone whereby the developer is maintained in a homogeneous state throughout the development zone to produce images of uniform quality.

4,050,414

ANIMAL TOILET

Wayne L. Knochel, and Robert S. Traeger, both of Rochester, Ind., assignors to KLT Industries, Inc., Rochester, Ind.

Filed May 17, 1976, Ser. No. 687,161
Int. Cl.[2] A01K *29/00*
U.S. Cl. 119—1 **4 Claims**



1. An animal waste disposal unit which includes a housing having two side walls and a bottom wall defining a fluid collec-

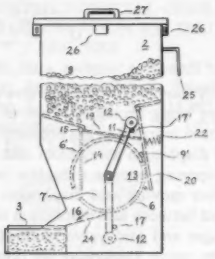
tor; a conveyor including an endless belt supported between spaced rollers and having an upper run where the animal stands to deposit its excreta; said conveyor having a discharge end; the improvement comprising means connecting said conveyor at its opposite end from said discharge end thereof to said housing for pivotal movement of the conveyor relative to said housing over said fluid collector; means for rotating said belt; said belt having a lower run spaced from said upper belt run; spray means located within said fluid collector for directing fluid against said lower belt run to cleanse said belt; a trip lever means carried by said housing at the discharge end of said conveyor for contacting and yieldably supporting said conveyor discharge end in an elevated position; said trip lever means being yieldable into a depressed position when an animal steps upon said belt upper run to allow slight pivotal movement of said conveyor about its housing pivot connection means; switch means associated with said trip lever means for activating said belt rotating means and spray means; and receptacle means located at said conveyor discharge end for receiving any solid excreta carried upon said upper belt run as the belt is rotated.

4,050,415

SELF-CLEANING ANIMAL FEEDER

Robert Arthur Conger, 51 Upper Welden, St. Albans, Vt. 05478

Filed June 7, 1976, Ser. No. 693,715
Int. Cl.[2] A01K *5/00*
U.S. Cl. 119—51.5 **1 Claim**



1. A self-cleaning animal feeder, comprising:

a cylindrical measuring trough for food, having a lengthwise slot as a food gate, and being mounted to be turned about a horizontal axis, so that the slot can be turned upward or downward;

a housing whose walls form a bin for food chunks in an upper story, provide seats for the rotatable trough in an intermediate part of the housing, and give room lower than the measuring trough to a food tray for an animal;

a first hinged flap, braced by a pressure spring against the inner housing, to slide along the outer surface of the spinning trough, but holding back any food chunk, caught between said surface and the flap, until the slot comes up, setting the food chunk free;

a second hinged flap, being lifted by the slot edge after the food exit to where this flap butts with the first hinged flap, thus shutting off the food stream (FIG. 2);

a downward opening in the food bin, aligned with the slot of the measuring trough in its upturned position, while the round trough wall is keeping the outlet hole of the feeder shut;

two disk-shaped side walls of the measuring trough, of which one is fastened to a crank handle, adapted to turn the trough between two stops, one stop defining the upturned slot position for filling of the trough, the other marking the downturned position of the trough for emptying it;

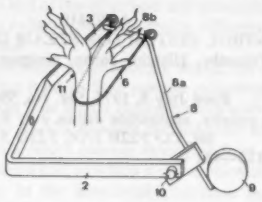
and a cover over the animal feeder, which cover may be removed, to supply food and water, the cover having latches, to fasten it to the feeder, and a handle on top, to transport the animal feeder.

4,050,416

SLING DEVICE FOR SUSPENDING ANIMALS OR ARTICLES

Patrick Amaudric du Chaffaut, Domaine St Aries, and Georges Petrulacci-Stephanopoli, Domaine de l'Etang, both of 84500 Bollene (Vaucluse), France

Filed Apr. 13, 1976, Ser. No. 676,422
Claims priority, application France, Apr. 17, 1975, 75.12038
Int. Cl.[2] A01K *37/00*
U.S. Cl. 119—97 R **12 Claims**



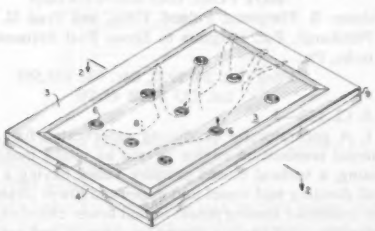
1. A sling device for suspending an animal or article comprising a generally C-shaped bracket member, a movable arm, means mounting said movable arm on said bracket member for movement between a rest position and an operative hanging position through an intermediate position, biasing means tending to urge said movable arm toward its rest position, a cordlike flexible member having a first point of attachment effectively connected to said bracket member remote from said movable arm mounting means and a second point of attachment on said movable arm, in said rest position, said biasing means pulling said cordlike flexible member taut with said points of attachment relatively remote from each other, in said intermediate position said points of attachment being brought into relative proximity of each other in response to a part of the animal or article being urged against the flexible member so as to start a loop therein, and in said operative hanging position said points of attachment being once again relative remote from each other owing to the hanging weight of the animal or article on said movable arm, thereby tightening the loop in the cordlike flexible member about said part of the animal or article.

4,050,417

CAT AND DOG COMBINATION STRETCHER AND SCRATCHER

Robert P. Ellis, 350 Lomas Santa Fe Drive, Solana Beach, Calif. 92075

Filed June 29, 1976, Ser. No. 700,761
Int. Cl.[2] A01K *29/00*
U.S. Cl. 119—156 **1 Claim**



1. A combination cat and dog stretcher and scratcher pad comprising two sheets of smooth flexible material of equal size and configuration with their edges securely bonded together to

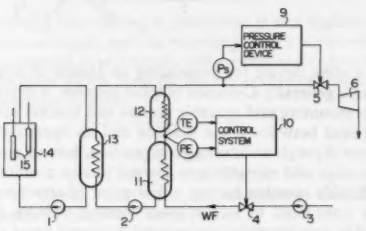
form a closed container, an inner flexible element impregnated with insecticide and encapulate within the two bonded sheets, said two sheets including holes therein which extend entirely therethrough for establishing a passageway between said inner flexible element and the exterior of said sheets, roughened projections extending outwardly from one sheet at each hole therein whereby said one sheet with said roughened projections may be used by an animal as a scratching pad with the weight of the animal causing insecticide vapors to be emitted through passageways onto said animals or the other smooth side may be used by an animal as a stretching pad with the weight of the animal causing insecticide to be emitted through passageways onto said animals.

4,050,418

CONTROL SYSTEM FOR STEAM GENERATOR

Takao Watanabe, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed July 8, 1975, Ser. No. 594,002
Claims priority, application Japan, July 8, 1974, 47-77285
Int. Cl.[2] F22B *1/06*; F22D *5/26*
U.S. Cl. 122—451 R **10 Claims**



1. In a steam generator having an evaporator for producing steam by heat-exchange between alkaline metal and feed-water and a super-heater for further heating the steam by heat-exchange between the steam produced by said evaporator and alkaline metal, an improved control system for the steam generator comprising:

a vapor temperature detector for detecting the vapor temperature at the outlet of said evaporator;

a vapor pressure detector for detecting the vapor pressure at the outlet of said evaporator;

first means receiving the outputs of said vapor temperature detector and said vapor pressure detector to thereby detect the fact that the vapor is in such a condition that liquid water may possibly enter into said super-heater and produce an output; and

second means for reducing the flow rate of the feed-water to be supplied to said evaporator, in response to the output of said first means.

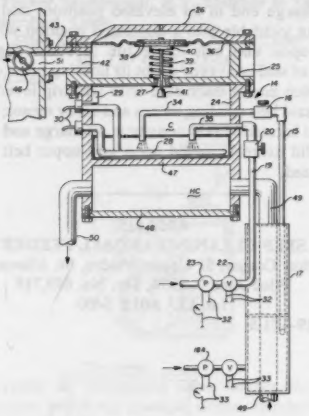
4,050,419

HOT FUEL GAS GENERATOR

Webster B. Harpman, Poland, Ohio, and Fred G. Mahoney, Pittsburgh, Pa., assignors to Econo Fuel Systems, Inc., Latrobe, Pa.

Filed Oct. 24, 1975, Ser. No. 625,565
Int. Cl.[2] F02B *43/00*
U.S. Cl. 123—3 **2 Claims**

1. A generator for producing superheated fuel gas for an internal combustion engine having an intake manifold, comprising, a vertical closed pressure vessel having a horizontal wall dividing said vessel into upper and lower chambers, electric resistance heating means in said lower chamber, means for energizing said heating means to generate and maintain temperatures between 600° and 1800° F therein, separate means for simultaneously continuously injecting predetermined amounts of gasoline and water into said lower chamber against said heating means so as to simultaneously change said gasoline to a gas and said water to steam, means for controlling the energization of said heating means and the amounts of water and gasoline injected for maintaining a desirable working pressure and volume of the superheated fuel gas in said lower chamber, whereby the molecules of the super heated fuel gas in its heated pressurized gaseous condition are caused to be spaced apart a sufficient degree of support substantially complete combustion in said engine, a pressure responsive device comprising a valve element in said lower chamber movable into and out of an opening located in said wall, a diaphragm in said upper chamber, an arm on said valve element attached to said



diaphragm for movement of said valve element thereby, said valve element being arranged to move into and restrict said opening upon an increase in gas pressure in said upper chamber moving said diaphragm away from said opening and to move out of said opening upon a reduction in gas pressure in said upper chamber moving said diaphragm toward said opening, means located between said diaphragm and said wall balancing said diaphragm and said valve element so as to permit said diaphragm to move responsive to pressure changes in said upper chamber, and an outlet in said upper chamber located between said diaphragm and said wall in communication with said inlet manifold.

4,050,420

CONSTANT PRESSURE-TEMPERATURE DELAYED COMBUSTION HIGH COMPRESSION RATIO ENGINE AND METHOD

Roy S. Cataldo, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 2, 1975, Ser. No. 574,046
Int. Cl.[2] F02N *35/02*
U.S. Cl. 123—30 C **3 Claims**

1. A method of burning air-fuel mixtures in an internal combustion engine to obtain efficiency and power while controlling emissions, said method comprising the steps of

supplying a lean combustible air-fuel mixture to a closed variable volume combustion chamber,

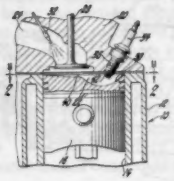
compression said air-fuel mixture through a predetermined volume ratio in the range between about 17 and 30 to 1, said combustible mixture being prepared with a combination of lean air-fuel ratio and fuel octane sufficiently high to prevent preignition and detonatien when so compressed,

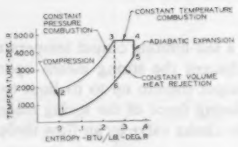
igniting said mixture other than by the heat of compression near the end of said compression step and burning said mixture following the end of said compression step,

expanding said mixture during and after combustion through said predetermined volume ratio with an output of work

to a movable wall associated with said combustion chamber, and

controlling the burning of said mixture to provide an initial phase of rapid combustion under substantially constant





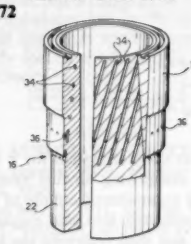
pressure conditions while raising the combustion gas temperature to a predetermined maximum temperature with the remainder of the fuel being burned under substantially constant temperature conditions at about said predetermined temperature.

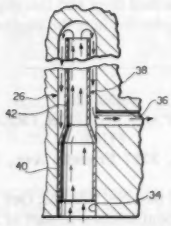
4,050,421

CYLINDER LINER WITH INTERNAL COOLING DUCTS FOR INTERNAL COMBUSTION RECIPROCATING ENGINES

Bruno Cendak, Trieste, Italy, assignor to Grandi Motori Trieste S.p.A. G.M.T. - Fiat, Ansaldo, C.R.D.A., Trieste, Italy

Filed Aug. 5, 1976, Ser. No. 711,897
Claims priority, application Italy, Aug. 27, 1975, 69144/75
Int. Cl.[2] F02F *1/10*
U.S. Cl. 123—41.72 **4 Claims**





1. A cylinder liner for internal combustion reciprocating engines, of the type having a neck which in use of the liner extends between a cylinder block and a cylinder head of the engine and means defining a number of internal cooling ducts in the neck for the through flow of a cooling liquid which in use of the liner enters these ducts from a means forming an annular space surrounding the part of the cylinder liner located within the cylinder block and which emerges from the said ducts into a means forming a collection chamber which surrounds the neck and from which the cooling liquid is directed towards the cylinder head,

wherein the improvement consists in the means defining each of the internal ducts in the liner comprising:

means defining a blind hole communicating with the said part of the liner and extending towards the cylinder head;

means defining a hole extending transversely with respect to the blind hole and communicating with the latter to provide communication between the blind hole and the collection chamber, the transverse hole being located adjacent the open end of the blind hole and debouching on the outside of the cylinder liner in a region different from that of the neck, and

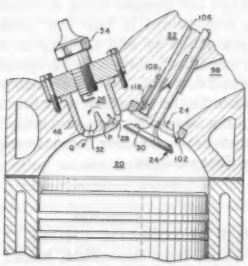
baffle means extending longitudinally within the blind hole and subdividing it into a flow passage extending from the end of the blind hole which communicates with the annular space up to a point adjacent the blind end of the blind hole, and into a return passage extending from said point adjacent the blind end, at which it communicates with said flow passage, to the associated transverse hole which communicates with the collection chamber.

4,050,422

APPARATUS FOR SUPPLYING RICH AIR/FUEL MIXTURE IN AN INTERNAL COMBUSTION ENGINE

Masaaki Noguchi, Nagoya; Yukiyasu Tanaka, Okazaki; Setsuro Sekiya, and Katsuhiko Motosugi, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 6, 1975, Ser. No. 629,229
Claims priority, application Japan, Nov. 13, 1974, 49-130014
Int. Cl.[2] F02B *19/10*
U.S. Cl. 123—75 B **9 Claims**



1. An apparatus for supplying a rich air/fuel mixture for an internal combustion engine comprising:

a. an air/fuel intake;

b. an intake valve for controlling said air/fuel intake; and

c. a tube for supplying a rich air/fuel mixture, said tube terminating at the back surface of the intake valve when said valve is closed, the wall of the outlet end of said tube being reduced in thickness for adapting itself by deformation to recession of the intake valve due to wear.

4,050,423

IGNITION TIMING ADJUSTING DEVICE FOR INTERNAL COMBUSTION ENGINES

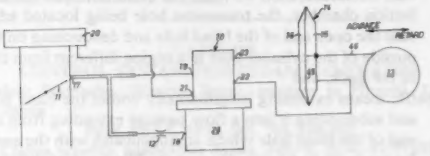
Masami Inada, Toyoake; Yasuhiro Kawabata, Toyota; Katsujiro Sato, Toyota, and Akinori Osanai, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha and Toyota Jidosha Kogyo Kabushiki Kaisha, BoliviaTH OF JA

Filed Oct. 23, 1975, Ser. No. 625,054

Claims priority, application Japan, Oct. 23, 1974, 49-122281; Oct. 29, 1974, 49-125206; Oct. 29, 1974, 49-125207

Int. Cl.[2] F02P 5/02

U.S. Cl. 123—117 A 8 Claims



1. An ignition timing adjusting mechanism in combination with an internal combustion engine having a carburetor with a throttle valve and a distributor with a breaker plate for the engine, comprising:

a vacuum actuator provided therein including a diaphragm piston forming first and second servo-chambers in said actuator and operatively connected to said breaker plate of said distributor, said diaphragm piston being moved in one direction from an original position to move said breaker plate in a retarding direction and being moved in the other direction to move the breaker plate in an advancing direction;

a change-over valve means interposed between said vacuum actuator and said throttle valve of said carburetor for selectively connecting said first and second servo-chambers to atmospheric air and a negative pressure port upstream of said throttle valve therethrough, said valve means being changed-over from a first position, in which said first and second servo-chambers are respectively connected to the atmospheric air and said negative pressure port to move said diaphragm piston in one direction, to second position in which said first and second servo-chambers are respectively connected to said negative pressure port and the atmospheric air to move said diaphragm piston in the other direction; and

means for delaying the switchover timing of said valve means to provide a predetermined time lag after occurrence of negative pressure at the throttle valve;

whereby when the throttle valve is closed and said valve means is conditioned in said first position, the breaker plate is positioned by said actuator in said original position, and when the throttle valve is opened with said valve means in said first position, the breaker plate is moved by said actuator in the retarding direction and subsequently moved in the advancing direction with the time lag upon switching-over of said valve means to said second position from said first position.

4,050,424

CARBURETOR AUTOMATIC CHOKE CONSTRUCTION

Thomas A. Nelson, West Bloomfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 194,935, Nov. 2, 1971. This application Aug. 24, 1973, Ser. No. 391,410

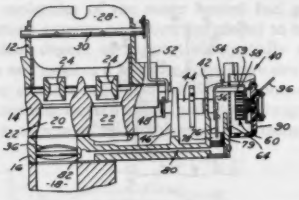
Int. Cl.[2] F02D 11/08; F02M 1/10, 23/04

U.S. Cl. 123—119 F 13 Claims

1. An automatic choke system for use with a carburetor having an air/fuel induction passage and

an unbalance mounted, air movable, choke valve mounted for variable movement across the passage to control air flow through the passage,

thermostatic spring means operably connected to the choke valve urging the choke valve towards a closed position with a force increasing as a function of decreases in the temperature of the spring means from a predetermined level,



and a self-limiting output temperature heater device located adjacent the spring means operable to transfer its heat output thereto up to its limit to reduce the choke valve closing force of the spring means and permit opening of the choke valve by air flow through the passage against it.

4,050,425

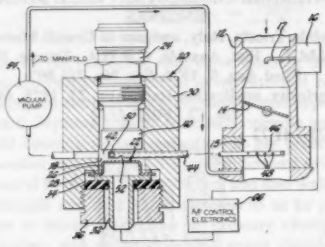
AIR-FUEL RATIO CONTROL SYSTEM

Bruce W. Holleboom, Grand Blanc, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 24, 1975, Ser. No. 634,605

Int. Cl.[2] F02M 7/00, 13/04

U.S. Cl. 123—119 EC 2 Claims



1. An air-fuel ratio control system for a throttled internal combustion engine comprising air-fuel ratio sensing means, means for supplying an unaltered sample of the throttled air-fuel mixture being inducted into said engine to said air-fuel ratio sensing means and then returning the sample for induction into the engine, ignition means for igniting the air-fuel mixture sample at said air-fuel ratio sensing means, and fuel system control means controlled by said air-fuel ratio sensing means for adjusting the fuel flow and thereby the air-fuel ratio of the mixture being inducted into the engine toward the stoichiometric value.

4,050,426

METHOD AND APPARATUS FOR TREATING LIQUID FUEL

Charles H. Sanderson, 3717 Frictcha Ave., Fort Wayne, Ind. 46806

Continuation-in-part of Ser. No. 518,243, Oct. 29, 1974, Pat. No. 3,951,807, which is a continuation-in-part of Ser. No. 399,164, Sept. 20, 1973, abandoned. This application Sept. 10, 1975, Ser. No. 612,212

Int. Cl.[2] F02B 75/10; B01D 35/06; F23D 21/00

U.S. Cl. 123—119 E 14 Claims

1. In an internal combustion engine including fuel/air mixing means and a fuel supply line in fluid communication with said mixing means, a fuel treating device in said fuel line, said device comprising:

an elongated hollow outer casing made of a magnetic material,
an elongated inner casing made of a non-magnetic material positioned within said outer casing,
a single elongated magnet received in said inner casing, said magnet being magnetized along its longitudinal axis and having at least two successive magnetic domains of alternating alignment so that there exist at least three longitudinally spaced apart sections of alternating north and south polarity,
means for supporting said inner casing in spaced relation to said outer casing to form an annular chamber therebetween,
inlet and outlet means connected to said fuel line for providing fluid flow from said fuel line through said annular chamber,
said inlet and outlet means being located near opposite ends of said annular chamber.

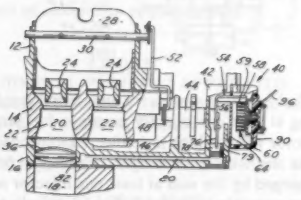
14. In a combustion process wherein a liquid fuel and an oxygen-containing gas are first mixed and then ignited, a method for treating the fuel just prior to mixing it with the gas comprising:
flowing liquid fuel over an elongated magnet in a direction substantially parallel to the longitudinal axis of said magnet, said magnet being magnetized along its longitudinal axis and having at least two successive magnetic domains of alternating alignment so that there exist at least three longitudinally spaced apart sections of alternating north and south polarity.

4,050,427

CARBURETOR AUTOMATIC CHOKE CONSTRUCTION

James E. Hollins, Inkster, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 2, 1971, Ser. No. 194,935
Int. Cl.[2] F02D *11/08;* **F02M** *1/10, 23/04*
U.S. Cl. 123—119 F **4 Claims**



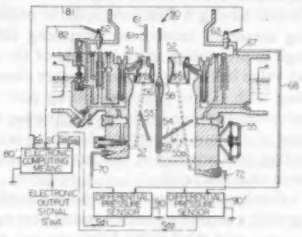
1. An automatic choke system for use with a carburetor having an air/fuel induction passage and
an unbalance mounted, air movable, choke valve mounted for variable movement across the passage to control air flow through the passage,
thermostatic spring means operably connected to the choke valve urging the choke valve towards a closed position with a force increasing as a function of decreases in the temperature of the spring means from a predetermined level,
and a self-limiting output temperature heater device located adjacent the spring means operable to transfer its heat output thereto up to its limit to reduce the choke valve closing force of the spring means and permit opening of the choke valve by air flow through the passage against it,
including means rendering the heater device operable above a predetermined ambient temperature level to begin transferring its heat output to the spring means,
and a heat sink secured to the heater device for uniformly radiating the heat of the heater device to the spring means.

4,050,428

CARBURETOR INTAKE AIR FLOW MEASURING DEVICE

Kenji Masaki, Yokohama, Japan, assignor to Nissan Motor Co., Limited, Yokohama, Japan

Continuation of Ser. No. 396,368, Sept. 12, 1973, abandoned.
This application Mar. 12, 1976, Ser. No. 666,316
Claims priority, applicetion Japan, Sept. 13, 1972, 47-91253
Int. Cl.[2] F02B *3/00, 33/00*
U.S. Cl. 123—119 EC **4 Claims**

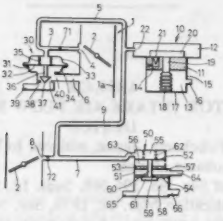


1. A carburetor intake air flow measuring device for electronically measuring an instantaneous flow rate of intake air introduced into an internal combustion engine under all varying engine operating conditions, which device comprises:
a two-barrel carburetor having a primary venturi and a secondary venturi:
first sensing means for sensing atmospheric pressure to produce an electric atmospheric pressure signal;
second sensing means for sensing intake air temperature to produce an electric air temperature signal;
third sensing means for sensing a primary differential pressure between said primary venturi and an upstream point and a secondary differential pressure between said secondary venturi and an upstream point to produce an electric differential pressure signal representing a difference between said primary and secondary differential pressures, said third sensing means having a primary mechanical differential pressure sensor responsive to said primary differential pressure to provide a primary analog mechanical output, a secondary mechanical differential pressure sensor responsive to said secondary differential pressure to provide a secondary analog mechanical output, and a mechanical-to-electric analog converter means to convert said primary and secondary mechanical analog output to the electric differential pressure signal, each of said primary and secondary mechanical pressure sensors comprising a respective diaphragm; and
electronic computing means responsive to said electric atmospheric pressure, intake air temperature and differential pressure signals, received as separate signals directly from each sensing means, to produce an electric output signal representing the instantaneous flow rate of said intake air.

4,050,429
EXHAUST GAS RECIRCULATION SYSTEM FOR AN AUTOMOBILE ENGINE, INCLUDING A HIGH ALTITUDE COMPENSATOR

Ikuta Yasuhiro, and Shimo Hitomi, both of Toyoda, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyoda, Japan

Filed May 24, 1976, Ser. No. 689,541
Claims priority, application Japan, Feb. 17, 1976, 51-16851
Int. Cl.² F02B *33/00*
U.S. Cl. 123—119 A **8 Claims**



1. In an exhaust gas recirculation system for an automobile engine, the improvement comprising:

a first valve having a first atomspheric pressure chamber having means to receive an increasing air flow therethrough in proportion to an increase of the altitude;

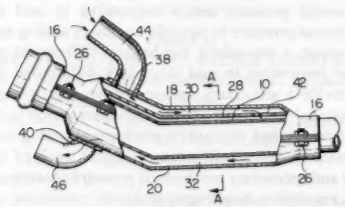
a second valve having a negative pressure chamber communicating with a first pressure sensing port opening to a carburetor, said second valve having means to control the amount of exhaust gas recycled into an intake manifold according to variation in the pressure of said negative pressure chamber; and

a third valve having a negative pressure chamber communicating with a second pressure sensing port opening to said carburetor, said third valve having means to control the amount of air supplied into the exhaust side of said engine according to variation in the pressure of said negative pressure chamber of said third valve, wherein said atmospheric pressure chamber of said first valve is connected with both said negative pressure chambers of said second and third valves.

4,050,430
INTAKE AIR WARMING DEVICE

Susumu Amagai, and Shigeru Oikawa, both of Yokohama, Japan, assignors to Nissan Motor Co., Limited, Japan

Filed Aug. 6, 1976, Ser. No. 712,052
Claims priority, application Japan, Aug. 8, 1975, 50-110362[U]
Int. Cl.² F02M *31/00*
U.S. Cl. 123—122 D **10 Claims**



1. An internal combination engine including an intake air warming device for warming intake air to be supplied to an intake system of comprising:

an exhaust gas conduit communicated with exhaust ports of the engine and through which hot exhaust gas is emitted to the atmosphere;

an elongated hollow housing surrounding said exhaust gas conduit to define therebetween an enclosed space;

at least one partition member disposed within said housing and spaced apart from the inside wall of said housing for radially separating said enclosed space surrounding said exhaust conduit into at least first and second air-warming chambers, said first air-warming chamber defined radially outside of said partition member and said second air-warming chamber defined radially inside of said partition member;

an air inlet opening into said first air-warming chamber and allowing air to flow therein;

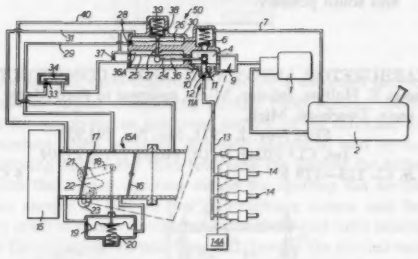
an opening provided in said partition member and allowing the air having entering said first air-warming chamber to flow therefrom into said second air-warming chamber; and

an air outlet opening into said second air-warming chamber and allowing the warmed air to be conveyed therefrom to the intake system.

4,050,431
FUEL INJECTION SYSTEMS FOR INTERNAL COMBUSTION ENGINES

Harold Ernest Jackson, Plymouth, England, assignor to Tecalemit Limited, England

Filed May 12, 1976, Ser. No. 685,444
Claims priority, application United Kingdom, May 15, 1975, 20646/75
Int. Cl.² F02M *39/00*
U.S. Cl. 123—139 AW **14 Claims**



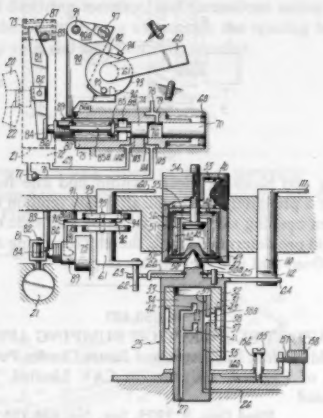
1. A fuel injection system for an internal combustion engine, including at least one injector nozzle, a fuel store, and at least one injector valve which is connected to receive fuel from the fuel store and which, when open, allows fuel from the store to be discharged by the said at least one injector nozzle, a metering valve operable to meter fuel continuously to the store at a rate dependent on an engine operating condition, and control means operable to open the injector valve intermittently whereby when the injector valve is closed, fuel delivered by the metering valve to the store is stored therein, the amount stored being dependent on the length of time during which the injector valve is closed and the metering rate of the metering valve, and when the injector valve opens, the stored amount of fuel is discharged by the injector nozzle, fuel being thereafter metered directly by the metering valve, through the store and injector valve, to the injector nozzle and discharged thereby until the injector valve closes.

4,050,432

FUEL INJECTION PUMP AND GOVERNOR AND TIMING CONTROL SYSTEM THEREFOR

Charles W. Davis; Robert Raufeisen, both of Simsbury, and Daniel Edwin Salzgeber, Windsor, all of Conn., assignors to Stanadyne, Inc., Hartford, Conn.

Filed July 22, 1975, Ser. No. 597,974
Int. Cl.[2] F02M *59/20*
U.S. Cl. 123—139 AQ 25 Claims



1. A liquid fuel injection pump suited for the sequential delivery of measured charges of liquid fuel under high pressure to an associated engine in timed relationship therewith comprising pump chamber means wherein the charges are pressurized to high pressure, a passage for delivering the fuel to said pump chamber means, a metering valve in said passage for regulating the amount of fuel in said measured charges of fuel, said metering valve comprising a pair of relatively movable members respectively having ports in the adjacent surfaces thereof adapted for registry, first means to vary the amount of overlap of said ports in a first direction to control the quantity of fuel in each measured charge of fuel in accordance with the load on the associated engine, and second means for controlling the relative movement of said members in a second direction transverse to said first direction to vary the amount of overlap of said ports in said second direction in accordance with the speed of the associated engine to increase the amount of overlap in said second direction with increased engine speed to maintain the quantity of fuel in sequential charges of fuel at a substantially constant level for a given setting of said first means regardless of changes in engine speed.

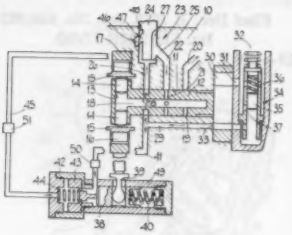
4,050,433

LIQUID FUEL PUMPING APPARATUS

Kanenobu Tokashiki, Kanagawa, Japan, assignor to Lucas Industries Limited, Birmingham, England

Filed Dec. 15, 1975, Ser. No. 640,858
Claims priority, application United Kingdom, Oct. 22, 1975, 43282/75
Int. Cl.[2] F02M *39/00*
U.S. Cl. 123—139 AQ 6 Claims

1. A liquid fuel pumping apparatus for supplying fuel to internal combustion engines, the apparatus comprising a first piston slidable within a cylinder, means coupling said first piston to a component of an injection pump whereby movement of said piston will alter the timing of delivery of fuel by the injection pump, first resilient means biasing said first piston towards one end of the cylinder, conduit means through which the pressure of fuel delivered by a feed pump can be applied to said first piston to move said first piston against the action of the resilient means and in a direction to advance the timing of delivery of fuel, a second piston housed within a further cylinder, second resilient means urging said second piston in the direction to engage said first piston to assist the action of fuel pressure acting on the first piston, said fuel pressure also acting on one side of said second piston to oppose the force exerted by the second resilient means, a further conduit through which a control pressure can be applied to the other side of said second



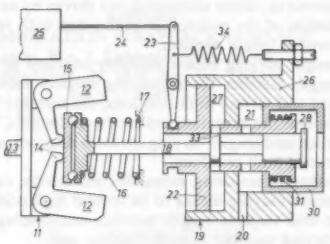
piston and valve means operable in conjunction with throttle means for generating said control pressure, said valve means being arranged so that said control pressure is substantially equal to the output pressure of the feed pump when said throttle means is set to provide a low quantity of fuel and is substantially zero when the throttle means is set to provide a high quantity of fuel.

4,050,434

HYDRAULIC SERVO-MOTOR

Gerhard Zbikowski, Friedrichshafen, and Salahaddin Geafer, Markdorf, both of Germany, assignors to Motoren- und Turbinen-Union Friedrichshafen GmbH, Germany

Filed June 2, 1975, Ser. No. 582,688
Claims priority, application Germany, June 22, 1974, 2430044
Int. Cl.[2] F02D *1/06*
U.S. Cl. 123—140 FG 16 Claims



1. A hydraulic servo-motor for the control of an internal combustion engine which comprises a servo-piston means adapted to be operatively connected with a fuel quantity control means of the internal combustion engine, control slide valve means adapted to be operatively connected with a centrifugal governor means of the internal combustion engine, and pump means providing a working medium under pressure, characterized by an auxiliary piston means which is acted upon by the pressure of the working medium and which is operable to enable with an existing pressure of the working medium, a stroke of the control slide valve means in one direction limited by the servo-piston means and a stroke thereof in the other direction limited by the auxiliary piston means, and spring means supported at the servo-piston means and acting on the auxiliary piston means opposite the pressure of the working medium, said spring means being operable to effectively clamp together the control slide valve means and the servo-piston

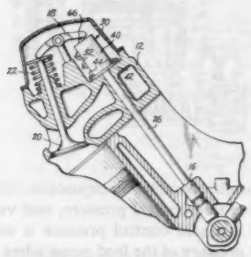
means by way of the auxiliary piston means when no pressure is present in the working medium.

4,050,435

VALVE CONTROL FOR CYLINDER CUTOUT SYSTEM

Harold L. Fuller, Jr., Washington, D.C., and Joseph E. Stubbs, Wheaton, Md., assignors to Harold L. Fuller, Jr., Washington, D.C.

Filed Dec. 2, 1975, Ser. No. 636,982
Int. Cl.[2] F02B 77/00
U.S. Cl. 123—198 F **11 Claims**



1. A device for selectively coupling or uncoupling a reciprocating pushrod member from a driven member, and for holding such driven member at an end-of-stroke position with respect to the pushrod member while the pushrod member motion is uninterrupted, the driven member having a return stroke driving means, comprising:

a. a support means disposed between a pushrod member and a driven member;

b. a variable length member connected to said support means and relatively movable with respect thereto;

c. coupling means on said variable length member for engaging a pushrod member;

d. means for selectively operating or deactivating said coupling means, whereby the variable length member may be selectively driven by a pushrod member when coupled thereto or, when uncoupled, not driven by same while the motion of the pushrod is unimpeded with respect to the variable length member;

e. length varying means movably attached to the variable length member for permitting relative motion between first and second limit positions, the variable length member being at minimum and maximum lengths, respectively, when said length-varying means is disposed at its first and second limit positions;

f. extension actuating means for selectively extending said length-varying means to its second limit position relative to said variable length member and holding the length-varying member at such position; and

g. said length varying means being drivingly connected to said driven member.

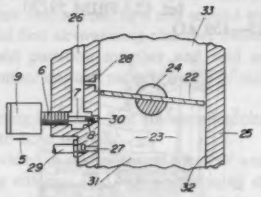
4,050,436

IDLE SYSTEM BLOCKING MEANS

Roger A. Crabtree, Rte. 1, Box 471, Summerville, S.C. 29483

Filed Mar. 17, 1976, Ser. No. 667,845
Int. Cl.[2] F02B 77/08; F02M 3/02
U.S. Cl. 123—198 DB **12 Claims**

1. A device which may be attached to an existing carburetor and which controls the discharge of idle system fuel mixture into said carburetor comprising blocking means placed into the idle fuel discharge port of said carburetor whereby idle system fuel mixture cannot pass said blocking means to be discharged into said carburetor; a power source; switch means responsively closed at ignition turn-off, operative to activate said blocking means through said power source simultaneously with ignition turn-off whereby excess idle system fuel mixture can be prevented from entering said carburetor to prevent engine dieseling; and time delay means connected in a series circuit with said power source and said switch means, operative to control the length of time said series circuit is closed after said switch means is closed responsive to the turn-off of said ignition, whereby said device prevents engine dieseling by



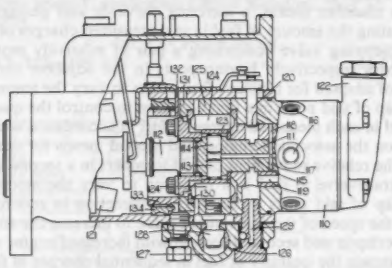
holding said blocking means within said idle fuel discharge port for a pre-determined time after said ignition is turned off, and then opening said series circuit by said time delay means, after said pre-determined time, thereby removing said blocking means from said idle fuel discharge port.

4,050,437

LIQUID FUEL INJECTION PUMPING APPARATUS

Reginald Hollett, Rochester, and James Charles Potter, London, both of England, assignors to CAV Limited, Birmingham, England

Filed Dec. 5, 1975, Ser. No. 638,155
Claims priority, application United Kingdom, Apr. 1, 1975, 13304/75
Int. Cl.[2] F04B 19/02
U.S. Cl. 123—139 AC **10 Claims**



1. A liquid fuel injection pumping apparatus for supplying fuel to an internal combustion engine the apparatus comprising a housing, an injection pump located in the housing and including an annular cam, cam lobes defined on said cam, a roller engageable with said cam, a pumping plunger mounted in a bore and movable by the roller as the latter engages a cam lobe to displace fuel from the bore, fuel feed means for supplying fuel to the bore to displace the plunger towards the cam, tapered end portions at the ends of the roller, a pair of stop rings positioned in the housing on the opposite sides of the roller, inclined surfaces on said rings for co-operation with said end portions of the roller to limit the movement of the roller and plunger when fuel is supplied to the bore, the spacing between said stop rings determining the allowed movement of said roller, a first adjustment means which is adjustable to determine the normal permitted maximum movement of the plunger, second adjustment means operable to allow an increased movement of the plunger whereby an increased amount of fuel can be supplied by the apparatus, said first adjustment means comprising first and second ring members mounted within the housing, said first ring member being accommodated within said second ring member, a screw

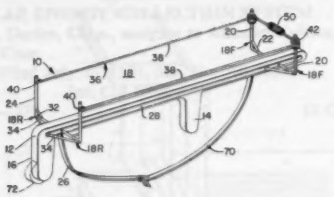
thread connection between said ring members, means restraining said second ring member against axial movement, further means restraining said first ring member against angular movement, an adjustment member operable to vary the angular setting of said second ring member thereby to adjust the axial setting of said first ring member, said first ring member engaging one of said stop rings, said second adjustment means comprising means operable to adjust the angular setting of said one stop ring, and interengageable formations on the presented faces of said first ring member, said formations acting in one position of the one stop ring to increase the spacing between said one stop ring and said first ring member.

4,050,438

SPRING TYPE PROJECTING DEVICE

James M. Pfotenhauer, 1302 N. 19th St., Escanaba, Mich. 49829

Filed July 14, 1976, Ser. No. 705,008
Int. Cl.² F41B 7/00
U.S. Cl. 124—20 R **7 Claims**



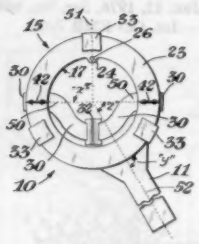
1. A slingshot comprising:
a stock having front and rear ends;
manual gripping handle means disposed at the rear end of said stock;
a pair of sheaves rotatably mounted adjacent the front end of said stock on opposite sides of the fore-to-aft longitudinal axis of said stock;
said sheaves being rotatable about generally upright parallel axes of rotation;
elastic band means having outer free ends thereof anchored at points disposed adjacent the rear end of said stock on opposite sides of said fore-to-aft longitudinal stock axis;
said elastic band means extending forwardly from said anchoring points and being wrapped around said rotatable sheaves;
said elastic band means including a pouch capable of carrying an object to be propelled;
said pouch disposed for manual rearward displacement in a direction parallel to said axis to stretch said elastic band means in an energy-storing fashion throughout the length thereof so as to propel said object forwardly upon release; and
front and rear support frames mounted on opposite sides of said fore-to-aft extending stock axis; each front frame including:
a front sheave mount section rotatably carrying one of said sheaves above the plane of said stock, and
a front section extending generally at a right angle from said front mounting section generally at a right angle from said front section and fixedly connected to said stock,
each rear frame comprising a rear section extending generally parallel to said front section and rear mounting section extending generally at a right angle from said rear section and being fixedly connected to said stock;
each of said free ends of said elastic band means being connected to one of said rear upright sections.

4,050,439

ACCURATE ADJUSTABLE SLING-SHOT

Christopher John Rudy, Midland, Mich., assignor to Thresher Institutes Incorporated, Midland, Mich.

Filed Nov. 6, 1975, Ser. No. 629,103
Int. Cl.² F41B 7/00
U.S. Cl. 124—20 R **36 Claims**



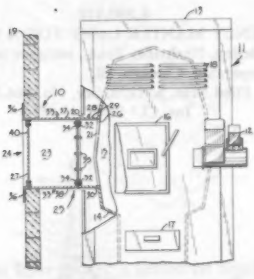
1. In a sling-shot assembly having a frame head portion with a handle portion depending therefrom to which frame head portion there is attached an aligned extensible elastic sling band for generally non-elongate missile hurling without physical missile guide means thereabout which extensible sling band is securely attached by the disconnected ends of said sling band at spaced points on and to the frame head portion of the body of the sling-shot that is over it's handle portion:
means rotatable in a substantially vertical plane in combination in said sling-shot for adjusting the points at which said disconnected ends of said sling band are secured and fixed to said frame head so that,
during operational usage of the sling-shot disposed in given situation according to the mode of grasp and stance employed by the user, the said points are disposed and situate relative to one another and to level ground in a plane that is at least substantially parallel to and with the plane of the level ground.

4,050,440

COMBINATION FIREPLACE/FURNACE

Charles L. Lessin, Rte. 1, Cohasset, Minn. 55721

Filed Sept. 28, 1976, Ser. No. 727,438
Int. Cl.² F24B 1/18
U.S. Cl. 126—120 **29 Claims**



1. A combination fireplace/furnace comprising:
a. a woodburning furnace having a firebox defining a fire chamber, said firebox having an opening therein;
b. means attached to said firebox and extending generally horizontally outwardly therefrom for defining a hollow tunnel surrounding the opening therein, said means being adapted for extension through a partition wall;
c. said tunnel having an open end spaced from said furnace for permitting viewing of said fire chamber through said

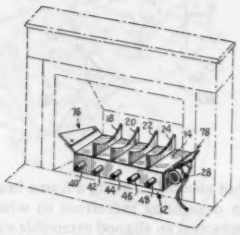
tunnel whereby said firebox may be disposed on one side of a partition wall and said open end may be disposed on the opposite side of said partition wall.

4,050,441

GRATE AND STOVE HEATING UNIT

Elwood R. Horwinski, Cheshire, Conn., assignor to Automobile Corporation of America, New Haven, Conn.

Filed Jan. 12, 1976, Ser. No. 648,316
Int. Cl.² F24B *7/00*
U.S. Cl. 126—121 **14 Claims**



1. A high efficiency heating unit for extracting heat from a fire, comprising in combination:

a. an enclosure having fluid inlet and fluid outlet ports, and having an expansive top wall constituting a grate for holding fire logs and coals,

b. a plurality of separate and distinct heat collector plates secured directly to the top wall and extending upwardly therefrom, said plates having means constituting a contoured top edge provided with raised front and rear end portions and depressed intermediate portions aligned with said raised portions for cradling and supporting logs placed on the grate to effect intimate, heat-exchanging contact with said logs, said plates being disposed in spaced relation with one another,

c. means connected with the fluid inlet port for supplying pressurized fluid to the same,

d. means connected with a fluid outlet port for channeling heated fluid in directions away from the enclosure, and

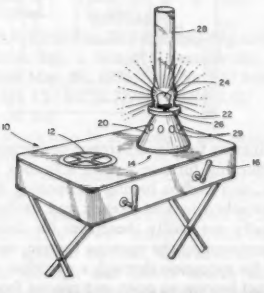
e. a plurality of heat-dissipating plates disposed in the enclosure and secured to the expansive top wall thereof, said heat-dissipating plates being arranged for intimate contact with the fluid passing through the enclosure to supply heat thereto.

4,050,442

EMERGENCY MANTLE LAMP FOR A GAS STOVE

John S. Seiverling, Nashville, Tenn., assignor to Aladdin Industries, Incorporated, Chicago, Ill.

Filed Mar. 5, 1976, Ser. No. 664,379
Int. Cl.² F24C *15/00*
U.S. Cl. 126—213 **5 Claims**



1. In combination with a gas cooking stove having a burner a portable lamp for converting a burner of said stove to a source of light, said lamp comprising:

a. a formed upright mantle to produce light when heated,

b. a conically shaped hollow base having perforations therethrough open at its top and bottom and dimensioned to cover the burner for conveying the gas flame from an ignited stove burner to the mantle,

c. a transparent chimney open at the top positioned about said mantle, and

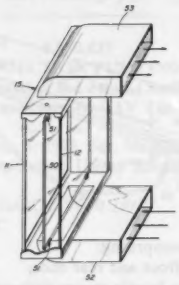
d. connecting means for securing the base and chimney to the mantle.

4,050,443

SOLAR ENERGY DEVICE AND SYSTEM

John F. Peck, and Carl N. Hodges, both of Tucson, Ariz., assignors to University Patents, Inc., Stamford, Conn.

Filed June 27, 1975, Ser. No. 590,809
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **2 Claims**



1. A system which constitutes a see-through portion of an enclosure and is operative to collect heat from solar radiation and transfer it to a utilization location comprising:

a light-transmissive exterior wall member;

a light-transmissive interior wall member spaced from said exterior wall member and substantially parallel thereto;

a see-through heat-absorbing pane of tinted glass mounted between said wall members in spaced substantially parallel relationship to both said wall members, the combination of said wall members and said pane providing unobstructed visibility;

a heat conducting fluid disposed between said heat absorbing pane and said light transmissive exterior and interior members; and

means for recirculating said fluid between the utilization location and said space between said inner and outer wall members.

4,050,444

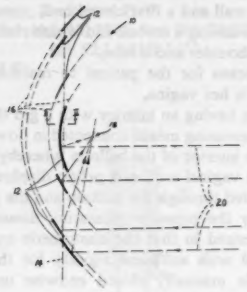
REFLECTIVE DEVICE

Peter William Dolamore, P.O. Box 10142, Johannesburg, South Africa

Filed May 22, 1975, Ser. No. 579,850
Claims priority, application South Africa, May 22, 1974, 74/3309
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **11 Claims**

1. A reflective device which includes a plurality of concave reflective regions arranged in sets, with the reflective regions of each set having a single co-incident focal region, the device having as many focal regions as there are sets and any two

consecutive reflective regions of one set being separated from each other by a reflective region of another set, the reflective



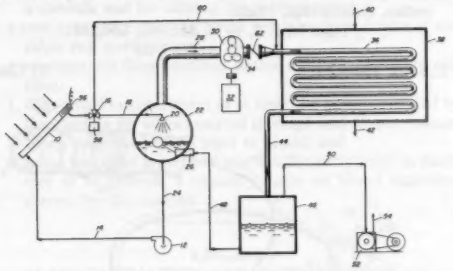
regions being disposed adjacent each other along a reference line to have a linear extended configuration.

4,050,445

SOLAR ENERGY COLLECTION SYSTEM

Henry Huse, Darien, Conn., assignor to Atlantic Fluidics, Inc., Stamford, Conn.

Filed July 23, 1976, Ser. No. 708,205
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **13 Claims**



1. A solar energy collection system including in combination a liquid containing solar heat collector, a vacuum chamber, a nozzle within said vacuum chamber receiving warmed liquid from said solar heat collector and spraying it into said vacuum chamber, a fluid containing vessel, passage-conduit means within said fluid containing vessel, means for transferring heat from said passage-conduit means to the fluid in said fluid containing vessel, vapor compression means receiving vapor from said vacuum chamber and delivering it to said passage-conduit means and means for delivering fluid from said vessel to use.

4,050,446

ENVIRONMENTAL HOOD AND DUCT STRUCTURE FOR GRIDDLES

Anthony A. Giuffre, 4344 N. 70th St., Milwaukee, Wis. 53216

Filed Aug. 4, 1976, Ser. No. 711,623
Int. Cl.[2] F24C *15/20*
U.S. Cl. 126—299 E **10 Claims**

1. An environmental hood and duct structure for griddles and the like, comprising:

a hood defining a spraying chamber having front portion including an air intake forwardly directed opening,

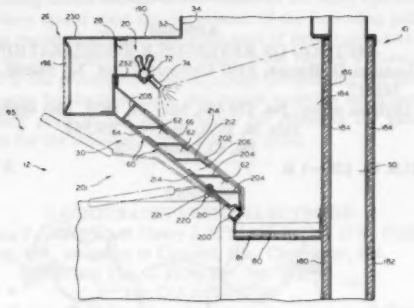
grilleing mounted in said opening and formed to define a plurality of grille openings each shaped to define a venturi fluid flow way between the air intake and discharge sides of the grilleing and having a venturi ratio in the range of from about three to one to about four to one,

said grilleing being forwardly and upwardly inclined at angle in the range of from about thirty degrees to about sixty degrees with respect to the horizontal,

said grille openings comprising air intake ports to said spraying chamber,

an upwardly open trough open to said chamber and positioned adjacent the lower end of said grilleing,

nozzle means positioned adjacent the upper end of said grilleing for directing a water spray across said grilleing toward said trough,



blower means for drawing air through said grille openings and said hood at a rate at least on the order of 1,000 cubic feet per minute,

and means for conducting from the trough water collecting therein,

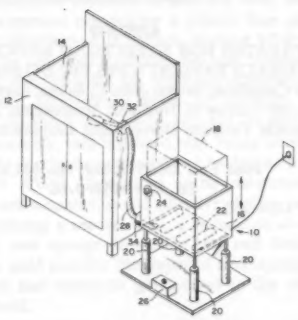
whereby, grease ladened air drawn through the grilleing openings is wet scrubbed of the grease, and the water carrying the grease collecting in the trough is conducted therefrom.

4,050,447

DEEP FAT FRYER HEATED FAT SUPPLY RESERVOIR AND FAT REPLENISHMENT DEVICE

Andrew Terracciano, 32 Wayhill Road, Waterford, Conn. 06385

Filed May 24, 1976, Ser. No. 689,084
Int. Cl.[2] A47J *27/14*
U.S. Cl. 126—374 **4 Claims**



1. In a deep fat fryer system, a heated fat supply reservoir and fat replenishment device comprising:

a. a supply vessel;

b. a deep frying vessel

c. means for heating the contents of said supply vessel;

d. means for sensing the fat level in said deep frying vessel, and

e d. means responsive to said sensing means for transferring an amount of fat from said supply vessel to said deep fat fryer;

f. said sensing means comprising an electrical signal generating means operative to generate at least two electrical signal levels responsive to fat levels;

g. means responsive to one of said two electrical signals to raise said supply vessel;

h. means responsive to another of said two electrical signals to lower said supply vessel; and

i. a feed tube connecting said supply vessel and said deep fat fryer.

4,050,448

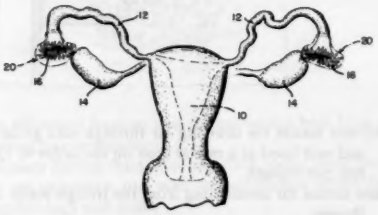
METHOD OF REVERSIBLE STERILIZATION

Jennings O. Borgen, 1100 University, Apt. 3J, Seattle, Wash. 98101

Division of Ser. No. 579,484, May 21, 1975. This application July 26, 1976, Ser. No. 708,552

Int. Cl.² A61F 5/00

U.S. Cl. 128—1 R **3 Claims**



2. A method of temporarily and reversibly capping the ends of the Fallopian tubes of a human female for reversible sterilization, comprising:

gaining access to the ends of the Fallopian tubes by incision,

capping the fimbriated ends of the Fallopian tubes with a cap of inert, medical grade, flexible, elastomeric material, and

suturing the cap around the tubes so that the cap encloses the fimbriated end of the tubes and provides an impervious barrier to the passage of sperm and ova therethrough without interfering with the perastolsis action of the ciliated cells of the Fallopian tubes.

4,050,449

APPARATUS FOR EXERCISING MUSCLES OF A FEMALE PATIENT'S PELVIC DIAPHRAGM

Frank S. Castellana, Bronx; John C. Byrne, Larchmont, both of N.Y., and Charles E. Huckaba, Washington, D.C., assignors to Medical Products Development Corporation, Larchmont, N.Y.

Filed Feb. 25, 1976, Ser. No. 661,104

Int. Cl.² A61B 5/00

U.S. Cl. 128—2 S **7 Claims**

1. Apparatus for exercising and measuring contractile power of muscles of a female patient's pelvic diaphragm, most particularly her vaginal wall muscles; the apparatus comprising:

an elongated balloon having a substantially cylindrical elastomeric wall and a first closed end,

the balloon having a second end which reduces in section to form a shoulder and a tube,

retainer means for the patient to maintain manually the balloon in her vagina,

the balloon having an interior with a gas therein,

pressure measuring means connected in flow communication with the interior of the balloon whereby exertions of the patient's vaginal wall and pelvic diaphragm muscles are transmitted through the balloon and the gas and are measured by the pressure measuring means; the apparatus characterized in that the elastomeric cylindrical wall is provided with sufficient rigidity for the balloon to be insertable manually closed endwise uniflated into the patient's vagina.

4,050,450

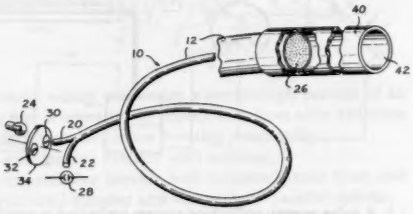
REFLECTION STANDARD FOR FIBER OPTIC PROBE

Michael Lajos Polanyi, Webster, and David Stanley Ostrowski, Dudley, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Mar. 5, 1976, Ser. No. 664,345

Int. Cl.² A61B 5/00

U.S. Cl. 128—2 L **17 Claims**



1. In a fiber optic probe for use in measuring amounts of diffuse reflection of light from a target medium, said probe having light conducting fiber means and a housing tubing surrounding said light conducting fiber means, said light conducting fiber means extending between the proximal and distal ends of the housing tubing with the corresponding end faces thereof exposed at said proximal and said distal ends of the probe respectively, the improvement comprising:

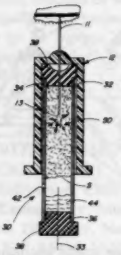
reflecting means for establishing a calibration standard, said reflecting means having a generally tubular passage therein defining an interior surface, said tubular passage having a diameter at least as great as said light conducting fiber means, said reflecting means extending distally from the end face of said light conducting fiber means at the distal end of the housing tubing with said passage in registry with said light conducting fiber means, at least said interior surface of said reflecting means being a material which characteristically diffusely reflects and returns a fixed ratio of at least two preselected wavelengths of light directed thereupon from said exposed face of said light conducting fiber means at said distal end of said probe when said distal end exposed face of said fiber means and said reflecting means is disposed in air and clear fluids, said returned fixed ratio of light providing a calibration standard.

4,050,451

BLOOD COLLECTION AND SEPARATION DEVICE

Richard Lewis Columbus, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 13, 1976, Ser. No. 714,433
Int. Cl.² A61B 5/10
U.S. Cl. 128—2 F 19 Claims



1. A blood collection and separation device for use with a blood-delivering cannula having a penetrating portion extending a predetermined penetrating length to an apertured tip, said device comprising

an elongated compartment having opposite end portions, one of which is for confining separated cells and the other of which is for confining separated serum;

closure means in at least said one end portion for admitting a cannula and for closing the compartment;

a vent aperture extending to the exterior of the device at said other end portion; and

a microporous filler confined within said compartment, said filler

1. filling said compartment at at least the point occupied by the cannula tip when inserted through said closure means,

2. being wettable by and inert to blood, and

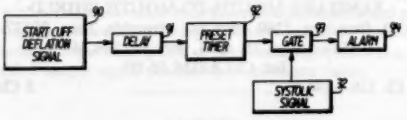
3. being provided with open pores sufficiently small in diameter as to provide a capillary draw on blood deposited therein by the cannula.

4,050,452

ALARM ACTUATION ARRANGEMENT FOR AN AUTOMATIC BLOOD PRESSURE RECORDER

Arnold S. J. Lee, Englewood, N.J., assignor to Milstein Medical Research Foundation, Inc., New York, N.Y.

Division of Ser. No. 617,175, Sept. 26, 1975, which is a continuation-in-part of Ser. No. 378,167, July 11, 1973. This application Apr. 21, 1976, Ser. No. 678,989
Int. Cl.² A61B 5/02
U.S. Cl. 128—2.05 A 3 Claims



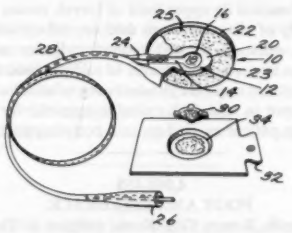
1. In an apparatus for automatically detecting and recording a succession of time-spaced blood flow surges occurring while a variable external pressure applied to a patient's artery is decreased over a first range including the systolic to diastolic pressure range of the patient, the apparatus comprising an inflatable cuff for applying the external pressure to the artery, means for pressurizing the cuff to a first predetermined value corresponding to the upper end of the first range, means operative when the cuff has reached the first value for depressurizing the cuff, and means for detecting successive blood flow surges caused by successive movements of the artery as the cuff is depressurized the improvement comprising an arrangement for actuating an alarm means if the first blood pressure surge during said depressurization does not occur within a prescribed interval commencing a fixed time after the start of depressurization of the cuff, when said depressurization proceeds at a substantially linear rate, the prescribed interval being indicative of an acceptable range of systolic pressures, the arrangement comprising, in combination, means coupled to the detecting means for generating an indicating pulse upon the occurrence of the first blood flow surge, normally enabled gating means interconnecting the output of the indicating pulse generating means and the alarm means for normally operating the alarm means upon the occurrence of the indicating pulse, means rendered effective upon the start of depressurization of the cuff for generating an auxiliary pulse having a duration equal to the prescribed interval, means for delaying the auxiliary pulse by the fixed time, and means applying the delayed auxiliary pulse to the gating means for disabling the gating means for the duration of the auxiliary pulse.

4,050,453

RADIOTRANSPARENT ELECTRODE

Horace T. Castillo, and Henry J. L. Marriott, both of St. Petersburg, Fla., assignors to Concept, Inc., Clearwater, Fla.

Filed Feb. 3, 1976, Ser. No. 654,911
Int. Cl.² A61B 5/04
U.S. Cl. 128—2.06 E 7 Claims



1. A disposable radiotransparent electrode which presents a substantially invisible image in X-ray photographs comprising a foam container provided with an adhesive surface, a first well cut in the adhesive surface of said foam container, a layered conductive structure mounted in said first well, said layered conductive structure comprising a plastic base and a gold metallic film layer deposited thereon of about 3,000 angstroms in thickness, an insulated wire with one end connected to said gold metallic film layer and the other end extending from said foam container, an electrical connector assembly, the other end of said insulated wire being secured to said electrical connector assembly, said insulated wire being constructed of an electrically conductive material and having a thickness not exceeding 36 AWG allowing it to be radiotransparent, a mounting board mounted to said adhesive surface, said mounting board defining a second well, a sponge received in said second well, said sponge projecting into said first well and engaging the gold metallic film layer of said layered conductive structure and electrode gel located in the well of the mounting board.

4,050,454

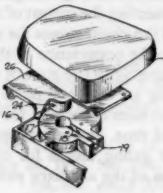
CHIROPRACTIC TABLE

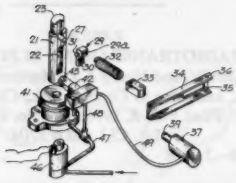
Carl Roger Ekholm, Elgin, Ill., assignor to Williams Manufacturing Company, Elgin, Ill.

Filed June 23, 1976, Ser. No. 698,963
Int. Cl.² A61F 5/00
U.S. Cl. 128—70 7 Claims

1. In a table for use in administering chiropractic adjustments, a base member having a bore, a vertical column slidably mounted in said bore, a body support mounted on said column, detent means bearing against said vertical column, a first air

cylinder for elevating said vertical column, a second air cylinder bearing against said detent means to provide a braking effect to hold said column at the upper limit of travel when raised with a patient lying in part on said body support, conduit means connecting said first and second cylinders to a source of air pressure, means for retracting said first cylinder when said





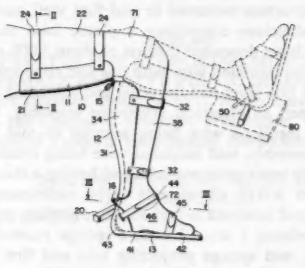
column has reached its upper limit of travel, means for cutting off the supply of air pressure to said second cylinder and for trapping air pressure in said second cylinder substantially proximate the upper limit of travel of said column, the trapped air pressure in said second cylinder being substantially equal to the air pressure in said first cylinder required for lifting the weight of the patient carried on said body support.

4,050,455

FOOT AND LEG BRACE

Lennie R. Smith, Kansas City, Kans., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed July 26, 1976, Ser. No. 708,511
Int. Cl.² A61F *3/00*
U.S. Cl. 128—80 F **2 Claims**



1. A brace assembly adaptable for fastening about the thigh, leg and foot of a user comprising a thigh section joined by a flexible strap to a leg section which is joined by a flexible strap to a foot section, each said section formed of a shaped plate, and each fitted with straps to fasten to the user, in which

the thigh section plate is shaped to fit about the rear of a user's thigh and the leg section plate is shaped to fit about the rear of a user's leg, with foot section shaped of a flat section adaptable for fastening to the sole of a user and joined to a heel section of a shape to fit about the sides and rear of a user's heel, and in which

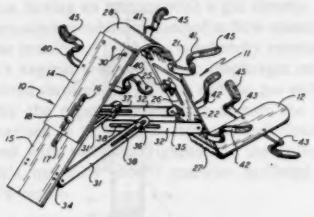
a bar member is hinged to the exterior of the heel section to project laterally on each side of the heel section, together with tension spring means to bias the bar along an axis perpendicular to the longitudinal axis of the foot section.

4,050,456

KNEE SPLINT

Robert L. Cornue, 3 Austin Road, Tully, N.Y. 13159

Filed July 21, 1975, Ser. No. 597,514
Int. Cl.² A61F *5/04*
U.S. Cl. 128—88 **1 Claim**



1. An adjustable knee splint including:

an upper leg engaging portion comprising a first pair of overlapping rigid plate members, and means for adjusting the extent of overlap of said first pair of plate members to adjust the overall length of said upper leg engaging portion;

a lower leg engaging portion comprising a second pair of overlapping rigid plate members and means for adjusting the extent of overlap of said second pair of plate members to adjust the overall length of said lower leg engaging portion;

a foot engaging portion hingedly connected to one end of said lower leg engaging portion;

a flexible, elastic sheet member connecting the other end of said lower leg engaging portion with one end of said upper leg engaging portion to separate the connected ends of said leg engaging portion, said sheet member having a non-metallic leg engaging surface;

connecting means for interconnecting said upper and lower leg engaging portions, said connecting means comprising pairs of slide members, each pair of slide members including first and second elongated, longitudinally slotted overlapping slide members connected respectively at one end to said upper and lower leg engaging portions, and releasable fastening means extending through the slots of the respective pairs of slide members to interconnect the other ends of slide members, said other ends being connected only to each other;

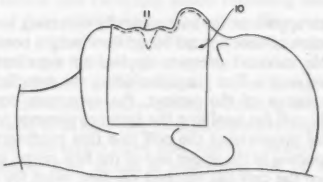
and straps connected to said upper and lower leg engaging portions and to said foot engaging portion, respectively, for securing a person's leg and foot to said splint.

4,050,457

SANITARY MOUTH-TO-MOUTH SHIELD

Stacy D. Davidson, 3240 Aden St., Memphis, Tenn. 38127

Filed Sept. 23, 1974, Ser. No. 508,247
Int. Cl.² A61M *16/00*
U.S. Cl. 128—145.5 **5 Claims**



1. A device for use in mouth-to-mouth, mouth-to-trachea or mouth-to-nose resuscitation comprising a one piece sheet of thin flexible material capable of assuming complementary

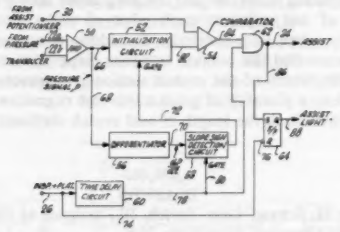
sealing relationship over the contour of a person's face and of sufficient dimensions to cover the face in the mouth and nose area and including an unobstructed opening located substantially centrally of said sheet and sized to be operably positioned over a patient's mouth, trachea or nose whereby an effective seal can be made between said patient's mouth, trachea or nose and a rescuer's mouth through the portion of said sheet surrounding said opening when said rescuer presses his mouth against said patient's mouth, trachea or nose through said sheet to prevent air escape around said patient's mouth, trachea or nose and to permit air to be blown therethrough into said patient's lungs in mouth-to-mouth, mouth-to-trachea, or mouth-to-nose resuscitation.

4,050,458

RESPIRATION SYSTEM WITH PATIENT ASSIST CAPABILITY

Jack M. Friend, West Hollywood, Calif., assignor to Puritan-Bennett Corporation, Kansas City, Mo.

Filed Jan. 26, 1976, Ser. No. 652,073
Int. Cl.² A61M *16/00*
U.S. Cl. 128—145.8 **8 Claims**



1. For use in a respiration system, apparatus for detecting a patient's inspiratory effort independently of absolute pressure, said apparatus comprising:

pressure sensing means, for sensing system pressure near the point of delivery of gas to the patient, including means for generating a pressure signal therefrom;

first electrical means for generating from said pressure signal a first output signal indicative of a first time differential signal;

second electrical means for generating a second output signal indicative of the sign of the second time differential of said pressure signal, whereby said second output signal is indicative of an increase in the rate of pressure drop during an expiration phase of the patient breathing cycle;

third electrical means responsive to said second output signal, for generating a third output signal indicative of the change in the system pressure; and

comparator means for comparing said third output signal with a reference value indicative of a predetermined pressure drop, and developing a control signal to initiate an assisted inspiration phase of the breathing cycle when said third output signal reaches said reference value.

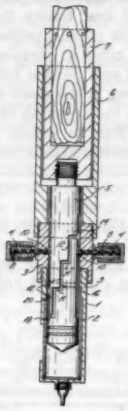
4,050,459

HYPODERMIC SYRINGE

Anacleto Montero Sanchez, Maria Auxiliadora 35, Salamanca, Spain

Filed May 20, 1976, Ser. No. 688,193
Claims priority, application Spain, May 23, 1975, 212610
Int. Cl.² A61M *5/00*
U.S. Cl. 128—218 C **5 Claims**

1. A hypodermic syringe comprising a barrel and a plunger slidably and rotatably received in said barrel, said barrel and plunger having cooperating cylindrical surfaces, one of said surfaces having track means comprising a circumferential section and two axially extend and radially off-set sections, adjacent terminal portions of said axial section being connected by said circumferential section and said axial sections extending in opposite axial directions from said circumferential section, and track follower means on the other of said surfaces, whereby said plunger may be moved axially in said barrel with said track follower means engaging a first axial section of said



track and thereafter moved further axially with said track follower means engaging said other axial track section to dispense, sequentially, doses of a medication in amounts related to the lengths of said track sections, said track follower means comprising a ball engaging in said track and spring means urging said ball radially into engagement with said track.

4,050,460

DEVICE AND METHOD FOR FEEDING FLUIDS TO CALVES AND THE LIKE

Joseph M. Magrath, P.O. Box 148, McCook, Nebr. 69001

Continuation of Ser. No. 543,990, Jan. 1, 1975, abandoned. This application Apr. 26, 1976, Ser. No. 680,380
Int. Cl.² A61D *7/00*
U.S. Cl. 128—223 **10 Claims**

1. A device for the manual feeding of fluids to animals which comprises:

a stiff esophageal probe tube having a protective enlargement at its discharge end;

a flexible and collapsible fluid reservoir having a relatively rigid outlet collar;

a detachable outlet fitting on said collar having an outlet nipple extending therefrom; and

a short length of flexible tubing fitted on said nipple at one end and on the inlet end of said probe at the other leaving a short length of free tubing therebetween affording swinging movement of said probe with respect to said nipple; said device being so constructed and arranged and the free length of said flexible tubing being sufficiently short that the tubing is collapsed and the passage therethrough closed by the swinging of said probe through a substantial angle from its unbent position whereby the passage of fluid therethrough is prevented.

4,050,461

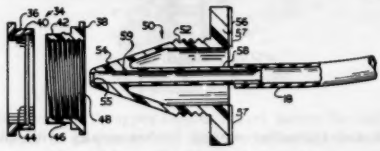
STOMA IRRIGATION SYSTEM

Max H. Ruby, 170 Hillside Ave., Waterbury, Conn. 06710

Filed Apr. 23, 1976, Ser. No. 679,672

Int. Cl.[2] A61M *3/00*

U.S. Cl. 128—227 **2 Claims**



1. A stoma irrigation device for use with a plastic drain sleeve of tubular configuration, whereby a colostomy patient is enabled to use said sleeve in the cone or combination cone-and-catheter irrigation methods under closed system condition, said device comprising

a coupling unit comprising a pair of axially interengageable annular members adapted to be axially slidably interfitted, one within the other from opposite sides of a plastic drain sleeve to encompass a section of the sleeve wall and form a fluid-tight seal about said wall section, one of said annular members being formed with attachment means for coupling a closure member thereto in fluid-tight relation, said annular members including complementary frictional interference elements which are engaged in the fully axially interfitted position of said members to frictionally retain them in such position and also to maintain said seal with the wall of said plastic sleeve; and

a closure member adapted to mate with said one annular member and detachably engage said attachment means to form a fluid-tight joint with said annular member after the encompassed section of plastic sleeve wall has been cut away, said closure member comprising a cone which is formed in its apical region to be received in said inner annular coupling member and to project inwardly beyond the inner end of said coupling member, said cone having at its base attachment means for detachably engaging said engagement means of said coupling to cause said apical region to protrude internally of the inner face of said coupling, said cone being formed with a passage extending axially therethrough and being formed with a tube for connection to a source of irrigating fluid.

4,050,462

DISPOSABLE DIAPER WITH ELASTICALLY CONSTRICTED CROTCH SECTION

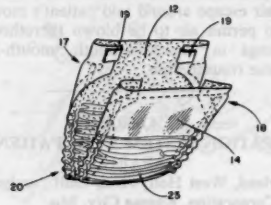
Lin-Sun Woon, and Dan D. Endres, both of Appleton, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Mar. 29, 1976, Ser. No. 671,177

Int. Cl.[2] A61F *13/16*

U.S. Cl. 128—287 **14 Claims**

1. In a disposable, unitary and generally elongate diaper having a substantially planar waist-band section at each end and a narrow substantially non-planar crotch section disposed between said ends in which said diaper is comprised of a porous facing sheet, a fluid-impervious backing sheet and an absorbent batt disposed between said sheets and in which the peripheries of said facing and backing sheets adjacent said batt are joined to each other, the improvement wherein said narrow crotch section is longitudinally contracted over its entire width by elastically extendible means, said contraction being



obtained by having at least one each of said elastically extendible means secured while in extended condition to at least one of said facing sheet or said backing sheet along the entire length of and adjacent each edge of said crotch section whereby when said elastically extendible means are relaxed and unextended the bonded together diaper structure across the entire width of the crotch section is contracted by said means into a plurality of gross transverse rugosities adjoining each other along the length of said crotch section.

4,050,463

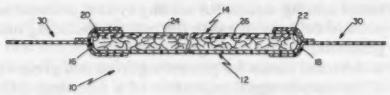
DIAPERS

Charles H. Schaar, Lake Zurich, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 20, 1976, Ser. No. 716,094

Int. Cl.[2] A61F *13/16*

U.S. Cl. 128—287 **10 Claims**



1. In a disposable diaper for contact with the body skin comprising a highly porous absorbent pad of cellulosic fibers and a water-impervious backing sheet adjacent and bonded to one side of said pad, that improvement wherein:

the fibers of said pad at the surface thereof opposite said backing sheet are bonded together with a resinous binder, said binder and said fibers bonded thereby forming a porous matrix and defining the top body contacting surface of said diaper.

4,050,464

SURGICAL CABLE TENSIONING INSTRUMENT

John Emmett Hall, Boston, Mass., assignor to Downs Surgical Limited, Mitcham, England

Filed Apr. 26, 1976, Ser. No. 680,235

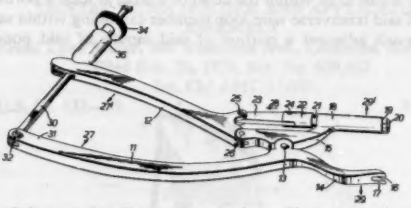
Claims priority, application United Kingdom, Apr. 28, 1975, 17613/75

Int. Cl.[2] A61B *17/00*; A61F *5/00*

U.S. Cl. 128—303 R **13 Claims**

1. A surgical instrument for applying tension to a cable for straightening a spinal column, said instrument having first and second handle hinged together at a main hinge, each handle having an extension beyond the hinge so arranged that movement about the hinge of the two handles toward one another causes the two extensions to move away from one another, wherein one extension has, at the end remote from the hinge, cable receiving means consisting essentially of a bifurcated

arm defining a slot open at one end to receive a cable, and wherein the second extension has, at the end remote from the hinge, two jaws between which a metal cable can be gripped, the instrument having means to ensure that movement togeth-



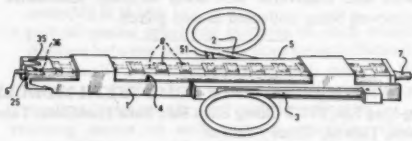
er of the two handles causes the jaws, if open, to close and movement away from one another of the two handles causes the jaws, if closed, to open prior to causing any movement of the two extensions relative to one another.

4,050,465

AUTOMATIC SURGICAL APPARATUS FOR LIGUTARING BLOOD VESSELS

Pierre Perisse, 8 rue du Strade, 31370 Rieumes, France

Filed Mar. 11, 1976, Ser. No. 665,900
Claims priority, application France, Mar. 14, 1975, 74.08039
Int. Cl.[2] A61B *17/12*
U.S. Cl. 128—326 **7 Claims**



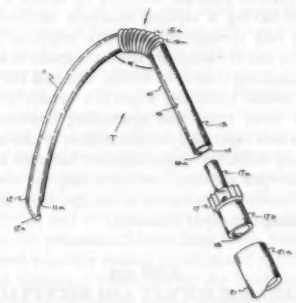
1. A surgical apparatus for use with knot carrying cartridges and intended for repetitively and instantly making ligatures on blood vessels which are cut, which has substantially the appearance of a haemostatic clamp, comprising a hollow elongate support, slidable means slidably mounted in said support, two arms each having one end pivotally mounted on respective sides of said elongated support and having a rug on the other end for receiving fingers of a user and including means for actuating said slidable means, a hollow elongate charger removably fixed within said elongate support said charger and support being complimentary to each other said charger including a tubular shaft having knot-carrier cartridges slidably mounted thereon that are threaded with a small clearance thereonto, said tubular shaft being arranged co-axially within said charger and connected by its rearward end to a vacuum source so that a suction force will be created at its front end, said charger including at its front end a cartridge disengaging means, each said cartridge comprising a single tubular part having a front end and deflection points diametrically opposed adjacent said front end and carrying a preformed knot within said tubular portion adjacent the front end, which is initially loose, and whose strands extend radially in opposite directions, and bear against said deflection points each of said strands coextending said cartridge to a point adjacent the rear end thereof, each of said strands coextending from said point in a direction transverse with respect to the axial direction of the cartridge, defining a catching portion thereof, each of said strands extending from said catching portion and being fixed on an anchoring portion of the cartridge, each cartridge including two slidable blades, one slidably mounted on each side of said cartridges and extending from the rear end thereof, the front portion of said blade for cutting the strands of the knot at the level of the radially directed portions of the strands, cooperating coupling means and disengagement means extending from the rear end of said cartridges beyond said cutting blades by means of which each cartridge is removably coupled to the preceding and the following cartridges so that the train of cartridges can be displaced as a group, and a heel on each said cartridge at the rear end thereof, gripping means mounted on said sliding means for gripping said heel when the corresponding cartridge arrives at the front end of the charger, link means connected between said arms and said slidable means for movement thereof in an alternating longitudinal movement which includes a first advance movement in the course of which said disengagement means provided on each cartridge and said disengaging means at the front end of the charger disengage the first cartridge of the train, or leading cartridge, from the following cartridge, and abutments on the front end of the charger to intercept the transverse catching portions of the strands, thereby tightening the knot, said link means further providing a first return movement of the leading cartridge so that its said respective cutting blades come into abutment with the following cartridge and are caused to slide from a retracted position to a cutting position to cut the strands of the tightened knot, a second advance movement in the course of which the leading cartridge is expelled from the charger, and a second return movement at the end of which the apparatus returns to its initial condition, the second cartridge assuming the position of the cartridge which had been expelled.

4,050,466

ENDOTRACHEAL TUBE

Kathleen C. Koerbacher, 636 Bonneau Lane, Mount Pleasant, S.C. 29464

Filed Oct. 8, 1975, Ser. No. 620,562
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—351 **7 Claims**



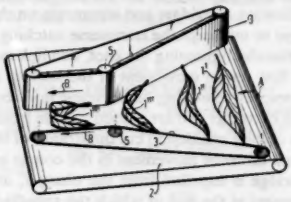
1. An endotracheal tube comprising a unitary tubular body member, said body member having an elongated arcuately shaped rear portion for insertion into the trachea, said rear portion having a beveled distal end, with side wall opening therein said body member further having an accordion pleated mid portion and a substantially straight, elongated front portion, said mid portion being yieldable to define an angle between said rear and front portions of at least about 90° to about 110°, and said front section being adaptable to receive a coupling member at a proximal end and being sufficient in length to place said coupling at a point away from a patient's mouth to avoid physical or visual impairment during use.

4,050,467

APPARATUS FOR ORIENTING TOBACCO LEAVES

Jan Adolf Van Sluis, Groningen; Frans Remko Reinhart, Leek, both of Netherlands; Johan Peter Johansen, Hon, and Rolf Pedersen, Oslo, both of Norway, assignors to Koninklijke Bedrijven Theodorus Niemeyer B.V., Groningen, Netherlands and Joh. H. Andresen, Oslo, Norway

Filed May 28, 1976, Ser. No. 691,213
Claims priority, application Norway, May 28, 1975, 751889
Int. Cl.[2] A24B 5/08
U.S. Cl. 131—147 A 30 Claims



1. Apparatus for conveying tobacco leaves to a shredding machine while orienting them such that the stems of the tobacco leaves will in large part be presented essentially perpendicular to the cutting plane of the shredder, comprising in combination:

horizontally extending conveyor means for receiving tobacco leaves in randomly distributed fashion and conveying them along a predetermined path;

tobacco leaf feed means for feeding tobacco leaves loosely onto said conveyor means at one region thereof; and

compressing means extending downstream of said one region for laterally compressing the loose tobacco leaves while displacing and deforming tobacco leaves which reside generally transverse to said path into a disposition in which the stems thereof largely extend longitudinally with respect to said path, said compressing means comprising upstanding conveyor elements extending first convergently with respect to each other and then in generally parallel relation whereby to define a trough-like channel having a tapered entrance section, means for driving said upstanding conveyor elements in the same direction and at essentially the same speed as said horizontally extending conveyor means, and said horizontal conveyor means including a portion which angles downwardly away from said upstanding conveyor elements beyond said tapered entrance section of the channel, and including deflector means disposed between said upstanding conveyor elements for crowding the compacted tobacco leaves downwardly to escape from between said upstanding conveyor elements.

4,050,468

REUSABLE POCKET ASH RECEPTACLE

Eugene E. Wynnyk, 17 Berlin St., Binghamton, N.Y. 13905

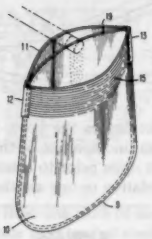
Continuation-in-part of Ser. No. 589,797, June 24, 1975, abandoned. This application Oct. 28, 1976, Ser. No. 736,399
Int. Cl.[2] A24B 5/02
U.S. Cl. 131—232 1 Claim

1. A pocket ash receptacle for receipt of ashes from smoking materials, said receptacle comprising:

a generally U-shaped pouch of flexible material, said pouch having a front side and a rear side, said front and rear sides being joined at their edge portions along the periphery of said U to provide said pouch with an openable mouth portion;

a resilient, U-shaped wire frame corresponding to the U-shape of said pouch, said frame being secured within the edge portions of said pouch and exerting outward pressure against said periphery of said pouch to maintain said mouth portion closed; and

a transverse wire loop member secured to lower leg portions of said U-shaped wire frame and extending upwardly therebetween, an upper portion of said loop member being of a size to fit within the bowl of a pipe, at least a portion of said transverse wire loop member extending within said pouch adjacent a portion of said mouth of said pouch



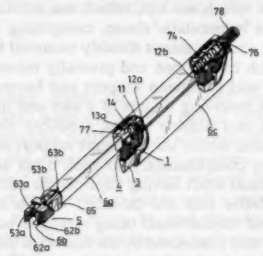
centrally between said front and rear sides of said pouch when said legs of said resilient wire frame are moved toward each other to open said mouth of said pouch, whereby said transverse wire loop member is disposed centrally in said mouth of said pouch to facilitate ash removal from said smoking material placed in contact with said transverse wire loop member, said ashes so removed being collected in said pouch.

4,050,469

COMB WITH DISPOSABLE COMB-TEETH MODULE

Chung-Sing Lin, 182-2 Chung Shan Rd., Shan Hua Chen, Tainan Hsien, Taiwan, China /Taiwan

Filed Sept. 7, 1976, Ser. No. 721,051
Int. Cl.[2] A45D 24/00
U.S. Cl. 132—11 R 5 Claims



1. A comb comprising:

a comb back portion;

a case member connected to one end of the comb back portion for serving as a handle; and,

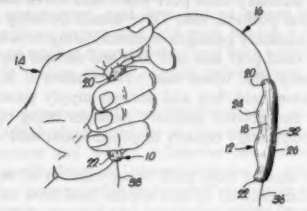
a plurality of comb-teeth modules arranged inside the case member; wherein each one of the comb-teeth modules includes a continuous wire wound helically into a plurality of normally-spaced apart coil-shaped comb tooth elements and a cap member removably capping the comb tooth elements in a compacted condition, thereby preventing the comb teeth from collecting dirt which may enter during opening of the case member and from an unintentional breakage of the case member and isolating the compacted comb-teeth modules from each other to prevent them from passing over or entangling with each other, each of the comb-teeth modules being adapted to be moved, by means of a dispensing mechanism in the case member, onto the portion of the comb back outside the

case member to resume an extended condition having comb teeth spaced apart for use after the cap member is removed.

4,050,470
DENTAL FLOSS HOLDER AND APPLICATOR ASSEMBLY

Ercell Lynn Miller, 500 Westwood Ave., Columbia, Mo. 65201

Filed Feb. 20, 1976, Ser. No. 659,662
Int. Cl.[2] A61C *15/00*
U.S. Cl. 132—89 3 Claims

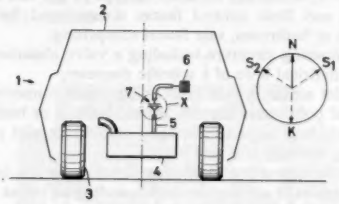


1. A dental floss holder and applicator assembly comprising:
a pair of separate, elongate members, each of said members being adapted to be individually grasped within a hand of a user whereby to position said members in spaced apart relationship during application of the floss to the user's teeth;
a length of floss extending between said members when the assembly is in use;
a pair of spaced apart end portions on each member, the distance between said end portions being sufficiently great to normally permit grasping of each member by three fingers of the hand of the user with the end portions extending oppositely beyond said three fingers;
retaining means on each member extending the length thereof between said end portions, said retaining means comprising a slot formed in said member along one elongate edge thereof.

4,050,471
CLOSING APPARATUS FOR VENTILATION LINES OF FUEL TANKS IN MOTOR VEHICLES

Sigmund Anhegger, Renningen, and Hans Colell, Schwieberdingen, both of Germany, assignors to Dr. -Ing. H.c.F. Porsche Aktiengesellschaft, Germany

Filed Jan. 21, 1976, Ser. No. 650,856
Claims priority, application Germany, Jan. 30, 1975, 2503731
Int. Cl.[2] F16K *17/36*
U.S. Cl. 137—39 5 Claims

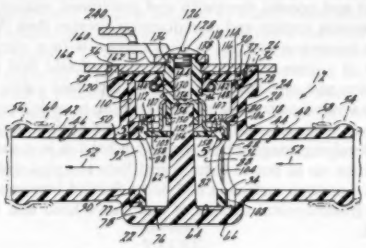


1. In a closing apparatus for ventilating lines of fuel tanks in vehicles, said closing apparatus comprising a housing in a ventilating line and movable closing means within said housing for closing said ventilating line in accordance with the position of a vehicle, the improvement comprising said closing means including a first ball-shaped movable member and a second movable member, said first member being disposed in a depression of a horizontal top surface of said second member above said second member, said second member being a conically configured mass body resting matingly on a conically configured guide wall of said housing, said mass body being guided in slidable movement along said guide wall, and said first member being movable to close said ventilating line at an exit opening of said housing.

4,050,472
FLUID VALVE

William L. Sheppard, Romulus, Mich., assignor to AVM Corporation, Jamestown, N.Y.

Continuation-in-part of Ser. No. 450,555, March 13, 1974, abandoned, which is a division of Ser. No. 263,863, June 19, 1972, Pat. No. 3,807,245. This application Nov. 11, 1975, Ser. No. 630,785
Int. Cl.[2] F16K *3/36*
U.S. Cl. 137—242 13 Claims



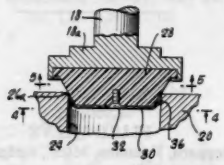
1. A fluid valve comprising: a housing having a valve chamber therein; means defining inlet and outlet passageways communicating with said chamber; a valve element disposed in said chamber rotatable generally about an axis between a closed position in which flow from said inlet passageway to said outlet passageway is blocked and an open position in which said flow is not blocked, said valve element having a generally hollow shape; and elastomeric sealing element disposed about the periphery of said outlet passageway between the adjacent wall of the said chamber and said valve element; spring means for biasing said valve element toward said sealing element in all positions of said valve element, said spring means comprising a generally flat spring member disposed between said valve element and a wall of said chamber, said valve element being arranged so that said valve element is urged against said sealing element by the pressure of inlet fluid in all positions of said valve element whereby sealing between said valve element and said sealing element is enhanced by the fluid pressure at said inlet passageway; actuating means actuable for rotating said valve element about said axis and including an actuating member and support means for mounting said actuating member for rotational movement about said axis, said support means including an elongated spindle-like member extending substantially along said axis and operatively connected at one end to said actuating member, the opposite end of said spindle-like member extending completely through said valve element and being operatively connected to said housing for maintaining said opposite end substantially free from transverse movement relative to said axis; and connecting means for operatively connecting said actuating member and said valve element for rotation about said axis and permitting transverse movement of said valve member relative to said axis towards and away from said sealing element.

4,050,473

VALVE SEAT CLEANING MECHANISM

Nakwon Cho, Knoxville, Tenn., assignor to Electro-Nucleonics, Inc., Fairfield, N.J.

Filed May 15, 1975, Ser. No. 577,947
Int. Cl.[2] F16K 1/38
U.S. Cl. 137—244 4 Claims



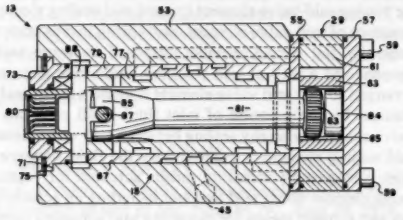
1. A valve comprising a valve head of resilient material in the shape of a frustum of a cone having first and second spaced apart transverse sections, the diameter of said first transverse section being less than the diameter of said second transverse section, and a flexible circular disk forming a part of said valve head and coaxial therewith and positioned against said first transverse section and of a diameter greater than that of said first transverse section, in combination with a circular valve seat of a diameter intermediate those of said first transverse section and said circular disk, in which said valve seat leads into a valve passage of circular section, in which said circular disk is puckered along the edge thereof against the surface of said valve passage when said valve head is in a valve closed position so as not to form a seal between said disk and said valve passage surface, a seal being formed between points on the frusto-conical surface of said valve head and said valve seat.

4,050,474

CONTROLLER FOR FLUID PRESSURE OPERATED DEVICES PROVIDING HIGH PRESSURE TO AN AUXILIARY DEVICE

David F. Morgan, Minnetonka, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 507,041, Sept. 18, 1974, Pat. No. 3,960,234. This application Apr. 16, 1976, Ser. No. 677,656
Int. Cl.[2] B62D 5/08
U.S. Cl. 137—596 2 Claims



1. A controller including a housing having an inlet for receiving a system fluid flow and an outlet, a pair of control fluid ports adapted for connection to a primary fluid pressure operated device and an auxiliary fluid port adapted for connection to an auxiliary fluid pressure operated device, said controller comprising:

a. valve means rotatably disposed within said housing and defining a neutral position, an operating position, and a central plane oriented generally perpendicular to the axis of rotation of said valve means;

b. a fluid meter associated with said housing and including a movable member operable to measure the volume of fluid passing through said fluid meter;

c. said valve means cooperating with said housing to define first and second supply passages in continuous open communication with said inlet and a first flow path including said inlet, said first and second supply passages, said fluid meter, one of said control fluid ports, the other of said control fluid ports, and said outlet when said valve means is in said operating position;

d. said valve means cooperating with said housing to define a second flow path communicating between said inlet and said auxiliary fluid port when said valve means is in said neutral position, said valve means defining first and second auxiliary passages communicating between said auxiliary fluid port and said first and second supply passages, respectively, when said valve means is in said neutral position, said first and second supply passages and said first and second auxiliary passages being oppositely and approximately equally disposed about said central plane; and

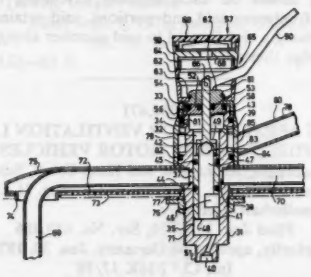
e. said second flow path being capable of communicating substantially all of said system fluid flow and said system fluid flow being progressively redirected from said second flow path to said first flow path as said valve means shifts from said neutral position toward said operating position.

4,050,475

MIXING FAUCET

Horace Watts, Pinner, England, assignor to H. & D. E. Watts Limited, England

Filed Aug. 19, 1975, Ser. No. 605,919
Claims priority, application United Kingdom, Sept. 13, 1974, 39957/74
Int. Cl.[2] F16K 11/07
U.S. Cl. 137—625.17 10 Claims



1. An hydraulically unbalanced type of hot and cold water mixing and flow control faucet dimensioned for use in a kitchen or bathroom, said faucet comprising:

a. a housing structure including a valve chamber having a cylindrical bore of a specific diameter;

b. inlet means in said housing structure connectible to hot and cold water supplies of said kitchen or bathroom and including respective hot and cold water inlet ports opening laterally into said bore;

c. outlet means in said housing structure for discharging said supplies to atmosphere and including an outlet port opening into said valve chamber at a point spaced axially from said inlet ports;

d. valve means movable relative to said housing structure comprising a one-piece cylindrical piston and a coaxial stem, the piston being disposed in said bore and the stem passing through one end of said valve chamber for connection to an actuating member, said piston and stem being movable as a unit in said bore by said actuating member in a rotary mode to control the relative degree of opening of said inlet ports and in an axial mode to control the absolute degree of opening thereof, and being movable

in at least one of said modes between two spaced limit positions, said faucet including stop means provided on the actuating member and said housing structure to define at least one of said two spaced limit positions, said stop means preventing excessive operator-induced stresses occurring in said cylindrical stem portion when said valve means is in said at least one limit position, and said valve means being axially movable from open position to closed position irrespective of its angular orientation in said bore;

e. first sealing means surrounding said stem and providing a seal between said housing structure and said stem to prevent water leaking along the stem from said valve chamber to atmosphere, said first sealing means being of a self-energising nature and said stem having a cylindrical portion of smaller diameter than said bore which moves in said first sealing means as said valve means is moved axially;

f. opposed transverse surfaces of different areas on said valve means which always remain in communication with said outlet means and which, whenever the valve means is moved axailly from said closed position, are subject to the line water pressure of at least one of said water supplies, th difference in areas of said opposed surfaces being equal to the cross-sectional area of said cylindrical stem portion, whereby whenever said valve means is moved axailly from said closed position to an open position it becomes biased axially by a nett force equal to the product of the cross-sectional area of said cylindrical stem portion and the water pressure then obtaining in said valve chamber, the diameter of said cylindrical stem portion being at most 6 millimeters in order to limit said nett force and so limit the frictional drag it is necessary to have between said valve means and said housing structure to prevent inadvertent axial shifting of said valve means when it is in a position intermediate said open and closed limit positions; and

g. drip-tight second sealing means isolating said inlet means from said opposed transverse surfaces and from said first sealing means whenever said valve means is in said closed position, whereby when said valve means is in said closed position said piston is relieved of said nett force and said first sealing means is relieved of the pressure of said water supplies.

4,050,476

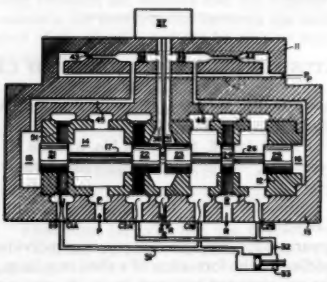
LOW NOISE HYDRAULIC SERVO VALVE

Paul F. Hayner, Lexington, Mass.; David G. Eldridge, Nashua, N.H.; Edgar R. Bernier, Nashua, N.H., and Richard B. Henderson, Nashua, N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Continuation of Ser. No. 93,308, Nov. 27, 1970, abandoned. This application July 10, 1972, Ser. No. 277,455

Int. Cl.[2] F15B *13/042*; F16K *11/07*

U.S. Cl. 137—625.62 **2 Claims**



1. A valve for controlling the flow of fluid from a source of fluid under pressure to a load and from said load to a return, including a valve body formed to define an interior chamber having ports communicating with said chamber for connection to said source, to said return and to first and second load conduits and including a valve spool having lands positioned relative to each other and to said ports so as to define a neutral position at which the flow of fluid from said source to said load and from said load to said return is blocked and also positioned so that upon displacement of said spool from said neutral position flow of fluid from said source to said load and from said load to said return is initiated in a sense and an amount determined by the direction and magnitude of such displacement, characterized in that said lands and said ports are also relatively positioned and said ports are adapted to be connected to said source, said return and said first and second load conduits so that, when connected, pressure differentials are established such that through any one port fluid tends to flow in but one direction, never tending to flow in the reverse direction and so that in said neutral position said lands block only those ports through which fluid tends to flow in the direction from said chamber to said ports, while displacement from said neutral position variably unblocks selected ones of said same ports as said spool is displaced in one or the other direction, leaving completely unblocked for all operative positions of said spool those ports across which the pressure differentials are such that fluid tends to flow from said ports into said chamber, and further characterized in that a restrictor matrix is included in each of those ports which is blocked by a land when said spool is in said neutral position, each of said restrictor matrices comprising a plurality of plates, each formed with a central bore having a diameter to form a sliding fit with said lands, and each formed with a plurality of raised baffles on one side thereof, said plates being positioned coaxially to form a stack having a central bore and defining a plurality of restrictive passages between each pair of adjacent plates for the passage of fluid radially outwardly.

4,050,477

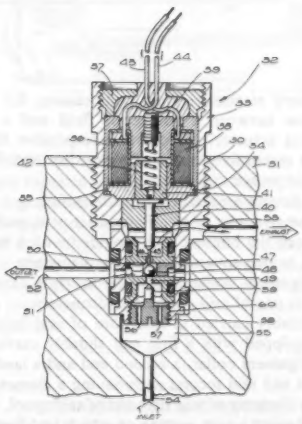
VALVE

Ali Acar, Los Angeles, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 31, 1975, Ser. No. 627,479

Int. Cl.[2] F15B *13/044*

U.S. Cl. 137—625.65 **7 Claims**



1. A three-way valve comprising: a body; a spherical ball; retaining means in said body slightly larger than said ball to trap the same in a confined space in said body, said retaining means having an inlet port, an outlet port, and an exhaust port; a solenoid mounted on said body; a ferromagnetic plunger slidable in said body; spring means to bias said plunger in one direction, said solenoid, when energized, pulling said plunger in a direction opposite said one direction, said plunger having

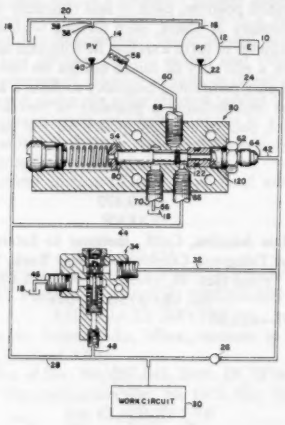
a cross section smaller than that of said exhaust port and movable in spaced relation thereto therethrough to a position contiguous to said ball, said outlet port being in communication with said confined space, said ball being movable to a position substantially covering said inlet port, said body having a passage in communication with said inlet port; input means connected to said solenoid to energize the same cyclically; electrical control means connected to said input means to vary the frequency at which the same energizes said solenoid; utilization means connected with at least one of said ports; and restriction means adjustable on said body to vary the amount of fluid pressure in said inlet port.

4,050,478

COMBINED FIXED AND VARIABLE DISPLACEMENT PUMP SYSTEM

Eugene P. Virtue, Tinley Park, and Richard J. Lech, Lockport, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Division of Ser. No. 570,970, April 23, 1975, Pat. No. 3,985,472.
This application May 4, 1976, Ser. No. 683,124
Int. Cl.² B67D *5/46*
U.S. Cl. 137—625.66 **3 Claims**



1. A pressure responsive fluid compensator for metering fluid flow between a source of fluid and a pressure responsive actuator, the pressure responsive fluid compensator responsive to one or more than one fluid pressure input source comprising:

a housing having a plurality of ports including a first inlet port, a second inlet port, a first outlet port, and a second outlet port; the housing also provided with a bore therethrough having several concentric diameters;

spool alignment collar having an aperture therethrough carried in one of said concentric diameters;

a spool slidably carried in said bore of said housing, said spool equipped with a first end slidably carried in said spool alignment collar, a second end and a land between said first and said second ends having a diameter greater than the diameter of said first end of said spool, said spool further having a core portion on which said first end, said land and said second end are formed, an arcuate portion at the end of said second end portion of said spool, said land having a circumferential groove formed therein, and an internal passage open at each end thereof between said circumferential groove of said land and said arcuate portion at the second end of said spool;

a biasing assembly carried in said housing urging said spool to its normal position in said bore of said housing whereby said land of said spool prevents fluid flow from said second inlet port to said first inlet port;

a first chamber formed in the housing accommodating said first end of said spool, said first chamber accessed only through said first inlet port;

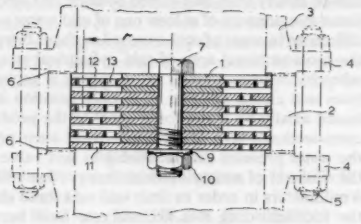
a second chamber formed in said housing, said second chamber accessed only through said second inlet port when said land of said spool is urged to its normal position.

4,050,479

FLUID RESISTANCE DEVICE

Hans D. Baumann, Foxboro, Mass., assignor to Masonellan International, Inc., Norwood, Mass.

Continuation of Ser. No. 591,172, June 27, 1975, abandoned.
This application June 7, 1976, Ser. No. 693,420
Int. Cl.² F15D *1/02*; F16K *47/08*
U.S. Cl. 138—42 **11 Claims**



1. A fluid resistance device comprising:

a vertical axis stack of coaxial, abutting horizontal circular plates,

each plate being subdivided into first and second, wedge-shaped segments,

at least one first segment per plate having a number of small, vertical, flow throttling holes therethrough,

at least one second segment per plate having at least one large, vertical, flow passing opening therethrough, said large vertical opening have a cross-sectional area exceeding the combined cross-sectional areas of the small vertical holes of said at least one first segment,

all stack plates being angularly displaced with respect to each other about the vertical stack axis so that in successive stack plates the large opening second segments overlap the small hole first segments, and

the small holes of successive vertically overlying small hole first segments being angularly displaced with respect to each other about the vertical stack axis

whereby are provided a number of tortuous fluid passageways extending through said stack in a vertical direction generally perpendicular to the horizontal plane surfaces of said plates.

4,050,480

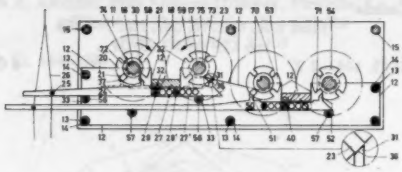
APPARATUS FOR SELECTIVE MOVING OF LAMELLA SHAPED HEDDLES

Alois Steiner, Rieden, Switzerland, assignor to Ruti Machinery Works Ltd., Ruti, Switzerland

Filed Apr. 6, 1976, Ser. No. 674,128
Claims priority, application Switzerland, June 6, 1975, 7328/75
Int. Cl.² D03C *13/00*; D03D *47/26*
U.S. Cl. 139—55.1 **16 Claims**

1. An apparatus for selective movement of individual lamella shaped heddles for the formation of a shed on a loom, in which the heddles are arranged between flat guide elements and are movable between them to form the shed, the apparatus comprising adjacent guide elements having a space therebetween the size of which permits two predetermined different lateral positions for each of the heddles; means provided to displace

each heddle selectively into one of the two predetermined lateral positions, and for each heddle a drive means so provided by which the heddle is driven in one direction when



displaced in one of the predetermined positions and in the opposite direction when displaced in the other predetermined position.

4,050,481

UNDULATED SHED LOOM WITH ELECTROMAGNETIC SHUTTLE DRIVE

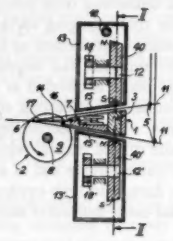
Walter Muller, Tann-Ruti, Switzerland, assignor to Ruti Machinery Works Ltd., Ruti, Switzerland

Filed Sept. 29, 1975, Ser. No. 617,688

Claims priority, application Switzerland, Oct. 24, 1974, 14223/74

Int. Cl.² D03D *47/26, 49/44*

U.S. Cl. 139—436 **16 Claims**



1. An arrangement for the transporting of shuttles filled with filling thread through the sheds of an undulated shed-type loom by fixed permanent magnetic means along the shuttle path of the loom, said magnetic means capable of producing varying magnetic fields with resultant components of force on the shuttles over the entire weaving width of the loom as the shuttles move along the shuttle path, and having means for the beat-up of the filling threads introduced against the fell of the cloth, the beat-up of the filling threads advancing synchronously with the movement of the transportation of the shuttles over the width of the loom: comprising a mechanical coupling means acting between the shuttles and the beat-up means in order to maintain the synchronism between the movement of the transport of the shuttles and the beating up movement of the beat-up means.

4,050,482

BATTERY PLATE PASTING METHOD AND APPARATUS

Larry K. W. Ching, Littleton; Charles E. Coleman, Lakewood, and Toshio Uba, Denver, all of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Mar. 31, 1976, Ser. No. 672,104

Int. Cl.² H01M *7/00*; B05C *11/00*

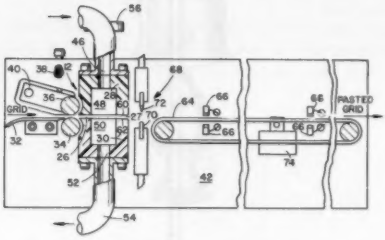
U.S. Cl. 141—1.1 **35 Claims**

1. A method for applying an electrochemically active paste onto a grid substrate of determined thickness in the preparation of battery electrode plates, comprising:

positioning first and second nozzle halves in juxtaposed relation and spaced apart a distance greater than the determined thickness of the substrate to define a passageway, each nozzle half having a cavity therein in at least partial alignment with the cavity associated with the other nozzle half, one of the cavities being provided with an inlet for reception of paste;

advancing the grid substrate through the passageway;

supplying paste to the inlet of the one cavity and forcing



paste through interstices in the advancing grid substrate and into the other cavity; whereby said grid substrate floats in the paste present in said passageway substantially filling the intersticis of said grid substrate and forming uniform layers of paste on the surfaces of said grid substrate; and

withdrawing the thus pasted grid substrate through the passageway.

4,050,483

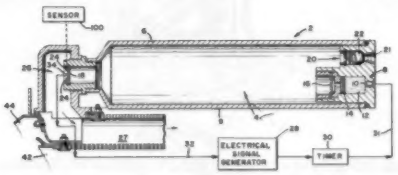
INFLATION SURGE DELAY

Robert J. Bishop, Rochester, Mich., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Oct. 14, 1975, Ser. No. 622,325

Int. Cl.² B65B *3/04*

U.S. Cl. 141—4 **6 Claims**



1. A method of delaying inflation of an air bag with an inflating gas supplied from a gas source through a plurality of manifold flow passages comprising the steps of restricting one of the flow passages during the time of initial flow to retard volumetric flow of gas into said bag and increasing gas pressure within said manifold to remove the restriction to flow and permit inflating gas to reach the bag through each of the flow passages a preselected period of time after release of said inflating gas therefrom.

4,050,484

LIQUOR-FLOATING DEVICE

Eugene Danyo, 1431 Windsor Drive, Toms River, N.J. 08753

Filed July 22, 1976, Ser. No. 707,869

Int. Cl.² B65B *1/14*

U.S. Cl. 141—34 **10 Claims**

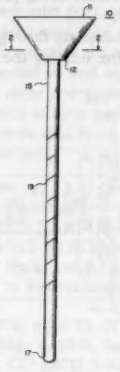
1. A device for controlling the flow of a liquor into a glass comprising:

a funnel-like cup portion having an enlarged upper opening and a smaller lower end;

an elongated shaft portion having an upper end and a lower

end, said shaft portion extending axially through said smaller lower end of said cup portion; and

at least one orifice between said cup portion and said shaft



portion, said orifice being directed toward, and extending into, said shaft portion, whereby said liquor, poured into said cup portion, will flow, at a controlled rate, through said orifice, down along the sides of said shaft portion.

4,050,485

LOPPING MACHINE FOR STEMS OF TREES

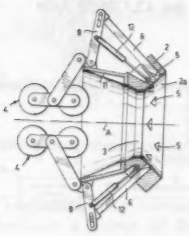
Antti Tapani Valo, 08100, Lohja 10, Finland

Filed Apr. 13, 1976, Ser. No. 676,598

Claims priority, application Finland, May 5, 1975, 75/1319

Int. Cl.² B27L *1/00*

U.S. Cl. 144—2 Z **4 Claims**



1. A lopping machine for stems of trees, which machine comprises an annular holder frame having an interior surface bounding a central opening for longitudinal passing of a tree stem to be lopped, said interior surface being frusto-conical and its diameter decreasing in the direction of movement of the tree stem, and a plurality of lopping rods each having a cutting end, said lopping rods being mounted in said annular holder frame with the cutting ends spaced apart from one another about the central opening and with each lopping rod being directed towards the central axis of the opening obliquely against the direction of movement of the tree stem, and each lopping rod being slidable in the axial direction thereof between a lopping position in which its cutting end projects through said interior surface into said central opening and a retracted position in which its cutting end is withdrawn from the central opening to a position beyond said interior surface, and the machine also comprising means connected to said rods for displacing said rods forcibly from said retracted position to said lopping position to engage a tree stem and for displacing said rods forcibly from said lopping position to said retracted position to wipe the rods free of branches and the like on movement through said interior surface.

4,050,486

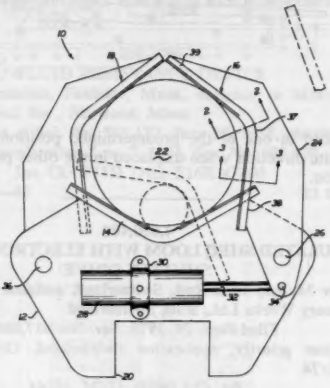
APPARATUS FOR DELIMBING TREES

Paul H. Whitcomb, Attica, N.Y., assignor to Eaton Yale Ltd., Canada

Filed Dec. 6, 1976, Ser. No. 748,080

Int. Cl.² A01G *23/08*

U.S. Cl. 144—2 Z **6 Claims**



1. In apparatus for delimbing trees comprising a delimbing blade having an inner tree engaging surface, a parallel outer surface and a limb cutting edge formed on an edge of said blade between said parallel surfaces, the improvement wherein a central region of said blade is beveled at an angle from said outer surface to form said limb cutting edge substantially at said inner surface, and wherein second regions of said blade disposed on either side of said central region are beveled at a first angle from said outer surface and at a second angle from said inner surface to form said limb cutting edge along a line disposed between said inner and outer surfaces.

4,050,487

ELECTRIC SHARPENER

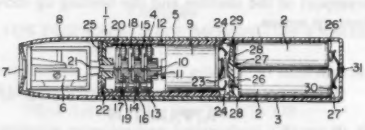
Kenichi Mabuchi, and Yoshihisa Tsuchimochi, both of Tokyo, Japan, assignors to Mabuchi Motor Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1975, Ser. No. 642,164

Claims priority, application Japan, Dec. 26, 1974, 50-3610[U]; Feb. 27, 1975, 50-27108[U]

Int. Cl.² B43L *23/02*

U.S. Cl. 144—28.5 **7 Claims**



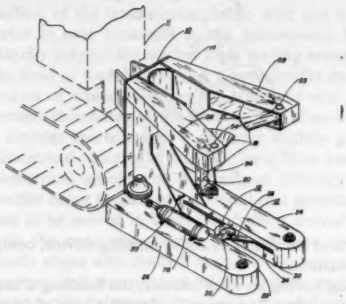
1. An electric sharpener, comprising: a battery section a sharpener section; a battery powered motor; a reduction means having planetary gears for transmitting the output of said motor to said sharpener section; and a switch section located between said motor and the battery section; whereby said sharpener section, said motor, and said reduction means define a slidable body which can move in the axial direction so that said switch is controlled by said movement in the axial direction.

4,050,488

CAM ACTUATED TREE CUTTING SHEARS AND BUNCHER

Alva Z. Albright, 2909 Monroe Highway, Pineville, La. 71360

Filed Apr. 23, 1976, Ser. No. 679,524
Int. Cl.[2] A01G *23/08*
U.S. Cl. 144—309 AC 5 Claims



1. Cam actuated tree cutting shears for continuously and automatically shearing and accumulating trees for bunching, in combination with a power train having an auxilliary hydraulic power system and a forward lift, comprising:

a. frame means having rear connections connecting it to said forward lift for moving and tilting said frame means for bunching, said frame means also having forwardly extending upper and lower pairs of arm means for receiving trees therebetween, and having raised floor means positioned rearwardly and between said lower pair of arm means;

b. openable and closable shear means mounted for forward and rearward motion in and between said lower pair of arm means;

c. camming means mounted rigidly in said lower pair of arms and a rotatably mounted follower means on said shear means for opening said shear means in said forward movement and closing said shear means in said rearward movement; and

d. hydraulically operable tree accumulating means for automatically engaging and lifting cut trees off said shear means and onto said raised floor means and for storing said cut trees thereon and between said upper pair of arms means.

4,050,489

METHOD FOR FABRICATING A LAMP BASE

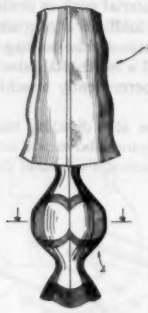
Harvey Albert Werner, 6531 Kessler Ave., Woodland Hills, Calif. 91367

Division of Ser. No. 695,965, June 14, 1976. This application Nov. 15, 1976, Ser. No. 741,884
Int. Cl.[2] B27D *1/10*
U.S. Cl. 144—315 R 2 Claims

1. A method for making a lamp base comprising the steps of:

providing a polyhedronal block of wood having a cross-section which is symmetrical about a longitudinal axis and having plane faces whose vertical intersections are parallel to said longitudinal axis; and

cutting said plane faces to vary the cross-sectional area of said block along its height and to form sides on said block which are curved in the vertical direction and straight in the horizontal direction, said sides intersecting each other to form curved edges which lie in a vertical plane.

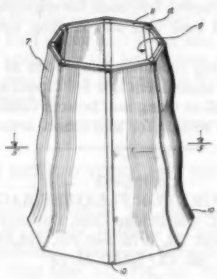


4,050,490

METHOD FOR FABRICATING A LAMP AND SHADE

Harvey Albert Werner, 6531 Kessler Ave., Woodland Hills, Calif. 91364

Filed June 14, 1976, Ser. No. 695,965
Int. Cl.[2] B27D *1/10*
U.S. Cl. 144—316 5 Claims



1. A method for making a lamp shade comprising the steps of:

providing a rectangular parallelepiped block;

cutting a plurality of nestable curved panels of similar shape from said block, said panels having vertical edges and being curved in a vertical direction with straight top and bottom faces in a horizontal direction;

providing a multi-faced form;

placing one of said multi-faced form;

joining the vertical edges of said panels together to form the shade; and

removing said form from said shade.

4,050,491

STORAGE BAG FOR USE WITH A STUDENTS CHAIR-DESK

Wilma Rae Hargrove, 1132 Livingston, Hurst, Tex. 76053

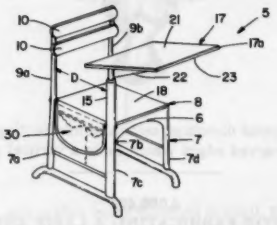
Filed June 21, 1976, Ser. No. 698,193
Int. Cl.[2] A45C *3/02*
U.S. Cl. 150—1.6 6 Claims

1. A storage bag for student school articles for use in conjunction with a chair-desk including a chair having a seat and back and a desk including a planar writing surface attached to an upright column support near a front edge of said seat, said column support being coplanar with a vertical back bracing

post member extending above a back edge of said seat and attaching to a supportive of said chair back, but separated from said column support by a distance D, comprising

a double fold of material such as denim or the like having first and second foldlines at top and bottom horizontal edges thereof so as to divide said bag into a front panel and a back panel, and a horizontal attachment line near said top foldline for permanently attaching said front to said back panel,

said attachment line also dividing said front panel into a bag-carrying subpanel above said attachment line and an article carrying stowage subpanel therebelow;



said carrying subpanel being horizontally closed by said first foldline and said attachment line but open along verticle sides thereof, to form a receptacle;

and a rod means positioned over its central portion within said receptacle of said carrying subpanel and having protruding, unobstructed, free ends, for engaging said column support of said desk and said bracing member of said chair;

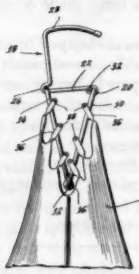
said article carrying subpanel being open at its top in the vicinity of said attachment line but closed along its vertical edges as well as along said bottom foldline to form an article stowage section for said school articles.

4,050,492

SUPPORT FOR FLEXIBLE BAG

Florian Leo Veilleux, Old Bridge Lane, Danbury, Conn. 06810

Filed Sept. 23, 1976, Ser. No. 725,975
Int. Cl.² B65D *33/16*
U.S. Cl. 150—4 **4 Claims**



1. A support for a flexible bag which comprises: a first partial ring member having diametrically spaced ends; a second partial ring member having diametrically spaced ends; means for hingedly interconnecting the ends of said first partial ring member with the ends of said second partial ring member whereby said members are movable from an open, closed ring, configuration to a collapsed, substantially side-by-side configuration; and an elongated member pivotally mounted on said first partial ring member including a curved latch portion engageable with said second partial ring member when in said collapsed configuration.

4,050,493

LADIES HANDBAG AND RADIO

Jin Sul Cho, G-3040 Bristol, Flint, Mich. 48507

Filed Jan. 5, 1976, Ser. No. 646,535
Int. Cl.² A45C *15/00*
U.S. Cl. 150—35 **7 Claims**

1. A combined handbag and audio emitting device, comprising, in combination:

a. a handbag having an open interior, the handbag comprising: a first sidewall, a second sidewall a pair of opposed end walls and a base,

b. a pocket formed in the interior of the handbag and being integrally formed with a sidewall thereof, the pocket comprising a pair of opposed sidewalls, a portion of the first sidewall of the handbag, a rotatable top wall, a base and an end wall, the edge of each of the sidewalls, the top wall and the base are secured to the first sidewall of the handbag above the bag thereof such that the pocket is elevated above the base thereof, the pocket being dimensioned to receive an audio emitting device therewithin,

c. an audio emitting device disposed within the pocket, the device comprising a volume control means and a station selecting means,

d. means formed through the handbag for permitting access to the volume control means and station control means exteriorly of the handbag, while the audio emitting device is disposed in the pocket, and

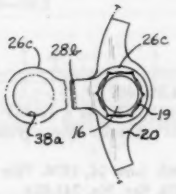
e. a mounting bracket extending between the end wall of the pocket and the base of the handbag.

4,050,494

ANTI-ROTATION LOCK FOR FASTENER BOLT

Robert B. de Claire, Grosse Pointe Woods, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 18, 1976, Ser. No. 697,588
Int. Cl.² F16B *39/10*
U.S. Cl. 151—49 **1 Claim**



1. In an engine-transmission assembly wherein the transmission includes a bell-like housing having a peripheral flange mating with an end face of the engine, the mating areas of the transmission flange and engine face having a number of aligned holes spaced therealong, a bolt having a threaded shank portion extending through each set of aligned holes for thereby rigidly connecting the engine and transmission together, each

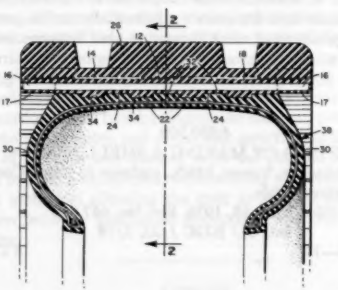
bolt having a head spaced outwardly from the exposed face of the transmission flange, and a washer associated with each bolt for preventing unthreading thereof from the transmission-engine assembly; each washer including a main plate section underlying the bolt head, and a blade section extending outwardly from said main plate section beyond the peripheral edge of the transmission flange; the main plate section of the washer including a wing area (23 or 25) extending along the surface of the transmission flange with one edge thereof located in near proximity to the transmission bell surface, to thereby prevent the washer from turning around the bolt axis; the head of each bolt having a non-circular outline defining a system of wrench flats on the bolt head side surfaces defing corners therebetween the blade section of each washer having a circular aperture with a diameter slightly greater than the diametrical spacing of the bolt head flats but less than the diametrical spacing of the corners between the flats; the washer being formed of a material that permits the blade section to be moved in hinge-like fashion around its connection with the main plate section, whereby the circular aperture axially aligns with the bolt head; the dimension of the circular aperture and the material of the washer enabling the blade section to be hammered down and around the bolt head so that the bolt head corners defined by the aforementioned flats pierce the blade material, thereby preventing relative rotation of the bolt and washer.

4,050,495

REMOVABLE TREAD BELT

Richard J. Olsen, Massillon, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 5, 1976, Ser. No. 646,432
Int. Cl.² B60C *11/00*
U.S. Cl. 152—187 **17 Claims**



1. A removable tread belt for installing about the circumferential outer surface of a tire carcass, said removable tread belt comprising:

an annular belt matrix having a ground contacting tread portion on the outer surface thereof,

a plurality of rigid bars installed in said belt matrix at spaced intervals around the circumference thereof, said bars extending across substantially the entire axial width of said belt matrix and being spaced radially inwardly of said tread portion, and

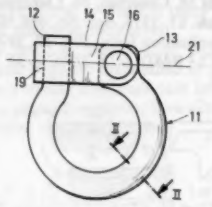
interlocking means on the inner surface of said belt matrix for engaging complementary interlocking means carried by said tire carcass.

4,050,496

CHAIN SHACKLE CONNECTOR

Erhard Alfred Weidler, Jahnstr. 32, 7084 Unterkochen, Germany

Filed July 31, 1975, Ser. No. 600,618
Claims priority, application Germany, Aug. 2, 1974, 2437815
Int. Cl.² B60C *27/06*
U.S. Cl. 152—241 **9 Claims**



1. A chain shackle connector for link chains, particularly tire chains, having a substantially C-shaped main body with an inlet slot for chain links which are to be connected to each other, in which the inlet slot can be bridged over by a closure piece which is held at one of the two ends of the main body by a removable connecting part which is arranged transversely to the plane of the main body in aligned receiving hole means in the main body and one end of the closure piece, characterized by the fact that the closure piece is provided on its end facing away from its end which has the receiving hole means for the connecting part, with a recess which can be brought over the other end portion of the main body, which has no receiving hole, only when the connecting part is not in connecting position in the hole means and when said connecting part is in connecting position in the hole means, said other end of said connecting part cannot be removed from said other end portion of the main body.

4,050,497

BELT FOR BELTED TIRES AND METHOD OF MAKING SAME

Henryk Pakur, Buckeburg, and Reinhard Tiemann, Hemmingen, both of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany

Filed Mar. 11, 1976, Ser. No. 665,951
Claims priority, application Germany, Mar. 12, 1975, 2510752
Int. Cl.² B60C *9/18*
U.S. Cl. 152—361 FP **3 Claims**

2. A belt for a belted tire which comprises an annular inner belt layer with first strength carriers extending over the width of said inner belt layer at a first angle and in a first direction with regard to the circumferential direction of said belt, an annular outer belt layer superimposed upon said inner belt layer with second strength carriers extending in a direction opposite to said first direction, the width of said outer belt layer being divided into two marginal sections and an intermediate section therebetween, said intermediate section having its strength carrier extending over the width of said intermediate section at the same angle as said first angle, and the strength carriers of said marginal sections extending only over the

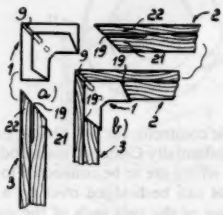
respective marginal section but at a second angle less than said first angle, said marginal sections and the outer marginal areas of said inner belt layer being folded over adjacent areas of said intermediate section.

4,050,498

FRAME PARTICULARLY FOR STRETCHING A PIECE OF PAINTING CANVAS

Renato Lucchetti, Via M. Generoso, 46, Lomazzo (Como), Italy

Filed Feb. 17, 1976, Ser. No. 658,568
Claims priority, application Italy, Feb. 18, 1975, 20361/75
Int. Cl.² B44D *3/18*; E04C *2/38*
U.S. Cl. 160—374.1 **3 Claims**



1. A frame particularly for stretching a piece of painting canvas laid thereon, which comprises four wooden strips or strips of an equivalent material arranged to form a quadrangle, the converging strips at each corner being jointed together by jointing in a right angle type of joint, said joint having a box-like structure provided with two converging channels or spaces, each receiving a strip longitudinally insertable thereinto with its end portion, wherein each strip has a prismatic configuration of generally rectangular cross-section, a step formed along the major surface thereof, thus defining a peripheral face which projects further out and whereon the piece of canvas can rest, and an underlying recessed face, underneath the canvas piece, and out of contact therewith when the canvas piece is stretched, each strip having at its end portions a 45° beveled end provided with a through slot extending longitudinally and parallel to the cross-section minor side of the strip and separating, at said step, the end of the strip into a rib portion and a tongue portion, each having a rectangular cross-section, and wherein, according to the improvement the joint is composed of a laminar or sheet material and comprises a flat base defining two converging and communicating channels at a right angle to each other, into which channels there are insertable and guidable, respectively, the tongue portions of the strips with the outer side wall of each channel inserted within said slot, said rib portion resting on and being guided by a portion of the base plane of the joint projecting beyond the channels, at the outer apex formed by the two channels a ridge perpendicular to the base plane in a diagonal direction externally to the box structure formed by the two channels, at the inner apex of the two channels converging portion a window and an adjusting element insertable through said window.

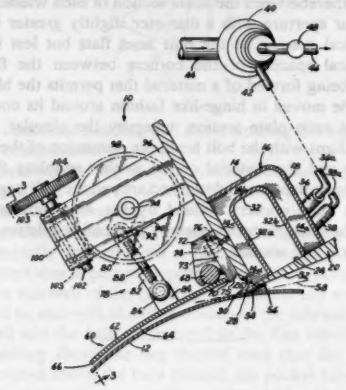
4,050,499

HEAD BOX FOR CYLINDER MOLDS HAVING A FLEXIBLE LID ELEMENT

A. Thomas Luey, Kalamazoo, Mich., and Frederick S. Hite, Downingtown, Pa., assignors to Boxboard Research and Development Association, Kalamazoo, Mich.

Continuation of Ser. No. 486,303, July 8, 1974, abandoned. This application Jan. 29, 1976, Ser. No. 654,237
Int. Cl.² D21F *1/06*
U.S. Cl. 162—317 **9 Claims**

1. In a papermaking machine of the cylinder type having a rotatable cylinder mold upon which fiber stock is deposited for forming a continuous fibrous web, the combination therewith comprising head box means supported adjacent said cylinder mold and including a dispersion chamber housing defining an internal stock dispersion chamber, said housing having an inlet for introducing fibrous stock into said internal chamber and having an elongated outlet located to deposit fibrous stock under pressure from said chamber onto the peripheral surface of said cylinder mold, said head box means further including a unitary curved lid element having a leading edge pivotally connected to said housing adjacent said outlet and having a trailing edge extending downstream from said outlet such that said lid element is in concave spaced relation to said cylinder mold, adjustment means secured to said lid element at a position intermediate said leading and trailing edges and operable to adjust selectively the spaced relation of said lid element to said cylinder mold, said unitary lid element being sufficiently



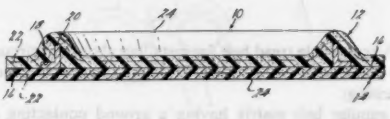
rigid to facilitate positioning of said lid element relative to said cylinder mold by said adjustment means to establish a pressurized stock formation area between said lid element and said cylinder mold but having a free cantilevered trailing edge portion spaced downstream from said adjustment means sufficient for predetermined flexing to vary the spatial relation of said cantilevered trailing edge portion to said cylinder mold in response to pressure changes within said stock dispersion chamber and to accommodate out-of-round cylinder molds, and at the same time maintain a substantially stable pressure within said pressurized stock formation area between said lid element and said cylinder mold from said outlet to said trailing edge of said lid element.

4,050,500

METHOD OF MAKING A SHELL MOLD

Jack T. Steinbacher, Vassar, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 15, 1976, Ser. No. 667,050
Int. Cl.² B22C *1/22*, *1/18*
U.S. Cl. 164—16 **4 Claims**



1. A method of making a thin reinforced shell mold from a resin-coated sand comprising the steps of:

A. investing a heated pattern with a mixture of sand and thermal setting resin to coat the heated pattern;

B. heating the coated pattern to cure the resin forming a base layer for the shell mold, the interior surfaces of the base layer being adapted to receive molten metal for forming a cast article;

C. applying a thin coating of a solution of inorganic silicate

and a wetting agent to the external surfaces of the base layer opposite the internal surfaces, the material penetrating at least a portion of the base layer; and

D. curing the inorganic silicate to form a reinforced thin shell mold.

4,050,501

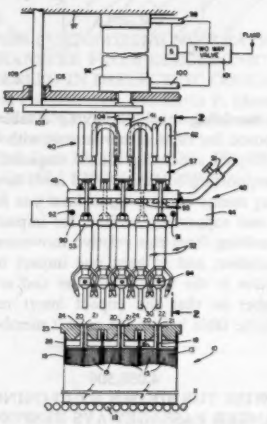
METHOD OF FUSING A METAL BATTERY TERMINAL POST WITH A METAL BUSHING

William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Division of Ser. No. 618,772, Oct. 2, 1975, Pat. No. 3,980,126, which is a continuation-in-part of Ser. No. 432,545, Jan. 11, 1974, Pat. No. 3,954,216, which is a continuation-in-part of Ser. No. 395,528, Sept. 10, 1973, Pat. No. 3,861,575, which is a division of Ser. No. 184,338, Sept. 28, 1971, abandoned. This application June 21, 1976, Ser. No. 697,759

Int. Cl.[2] B22D *25/04*; B23K *5/00*

U.S. Cl. 164—68 3 Claims



1. The method of fusing a lead alloy battery terminal post portion with a metal bushing portion which surrounds the post at a battery post hole, comprising the steps of: applying open flame to a heating element to raise the temperature of the heating element to a predetermined liquification temperature of portions to be fused and to directly heat at least a portion of said portions to be fused; bringing the element, post, and bushing into engagement and physically penetrating liquified portions of the post and bushing with the element for a desired depth to form a liquid melt; withdrawing the element from the liquid melt; and allowing the melt to solidify in connecting relation between unliquified portions of the post and of the bushing.

4,050,502

METHOD FOR CONTINUOUSLY CASTING A STRIP OF ALLOYED METAL

Jerome B. Allyn, Graytown; Richard D. Wileman, and John Kozak, both of Toledo, all of Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio

Division of Ser. No. 536,485, Dec. 26, 1974, Pat. No. 4,010,939. This application Aug. 10, 1976, Ser. No. 713,170

Int. Cl.[2] B22D *11/10*; F27B *9/04*

U.S. Cl. 164—68 1 Claim

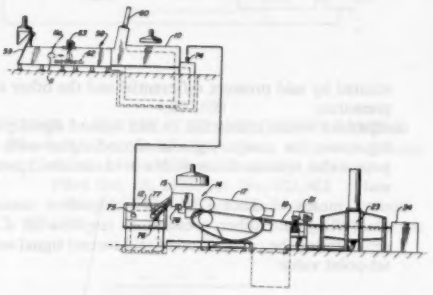
1. In a process for casting an alloyed metal such as calcium lead into a continuous strip for producing an end product such as battery grids and the like, said process casting a continuous strip of alloyed metal at a rate of at least 8 tons per hour by means of a casting machine and employing a tundish for feeding liquid alloyed metal into said caster and a holding box for metering at a constant rate liquid alloyed metal into said tundish, the improvement comprising the steps of:

charging, at predetermined intervals, metal and alloy hogs into a melting pot having a minimum liquid bath level therein by sliding said hogs down an inclined yieldable ramp, said ramp being submersed over a central portion thereof in said minimum bath level of said melting pot;

heating said bath level to a constant temperature of approximately 700° F. by electrical heating elements disposed within conventional protection tubes submersed entirely within said minimum bath level;

melting said hogs at said central portion of said ramp whereby said hogs are maintained at a constant elevation with respect to said minimum bath level;

maintaining a protective atmosphere substantially devoid of oxygen within said melting pot;



pumping said liquid metal from said melting pot to a holding pot through a closed conduit;

heating at a constant temperature said liquid metal in said holding pot by heating elements disposed within conventional pipes completely submersed within a minimum liquid metal bath level in said holding pot while maintaining a protective atmosphere withing said holding pot;

controlling the liquid levels in said melting and holding pots in dependent relationship with respect to one another by a float in each pot in contact with said bath level in each pot whereby said holding pot is effectively operated as a surge tank; and

pumping a portion of said liquid metal from said holding pot to said holding box through a closed conduit.

4,050,503

APPARATUS FOR CONTROLLING THE RATE OF FILLING OF CASTING MOLDS

Angel Tonchev Balevski; Ivan Dimov Nikolov; Dragan Iliev Nenov, and Emil Nikolov Momchilov, all of Sofia, Bulgaria, assignors to Institute po Metaloznanie i Technologia na Metalite, Sofia, Bulgaria

Division of Ser. No. 496,741, Aug. 12, 1974, Pat. No. 3,961,662. This application Jan. 23, 1976, Ser. No. 651,691

Claims priority, application Bulgaria, Aug. 16, 1973, 24336

Int. Cl.[2] B22D *17/06*, *17/32*

U.S. Cl. 164—155 3 Claims

1. Apparatus for controlling the rate of filling of a casting mold, comprising:

a first chamber containing a crucible for the material to be cast and first pressure means operatively associated with the first chamber for supplying a pressure P_1 to the crucible;

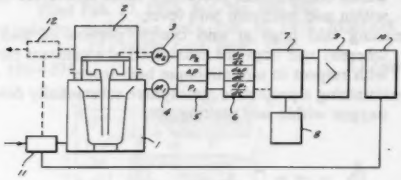
a second chamber adjacent said first chamber and containing a casting mold and second pressure means operatively associated with the second chamber for supplying a pressure P_2 to the mold;

a tube extending between said chambers and connecting said crucible to said mold for conducting said material into said mold at a flow rate determined by the pressure differential $P = P_1 - P_2$; first signal-producing means connected to at

least one of said chambers for producing a first signal representing the time derivative of one of said pressures;

monitoring means connected to said signal-producing means for monitoring said first signal and controlling said one of said pressures to maintain the time derivative thereof substantially constant;

second signal-producing means connected to said first signal-producing means for providing a second signal representing the time derivative of one of the parameters con-



stituted by said pressure differential and the other of said pressures;

comparison means connected to said second signal-producing means for comparing said second signal with a set-point value in accordance with a predetermined program; and

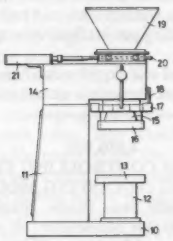
control means connected to said comparison means for controlling said other pressure in response to a signal representing the comparison of said second signal and said set-point value.

4,050,504

CORE-BLOWING MACHINE FOR PREPARING MOULDS AND FOUNDRY CORES

Julius Hansberg, Via Bellinzona 31/2, Modena, Italy

Filed Apr. 30, 1976, Ser. No. 682,354
Claims priority, application Italy, Apr. 30, 1975, 22897/75
Int. Cl.² B22C *15/24*
U.S. Cl. 164—201 **9 Claims**



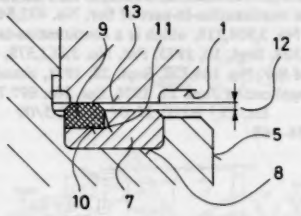
1. In a core-blowing machine for making moulds, foundry cores and the like, said machine comprising a forming mass container, a sandslinger head arranged below said container, a ramming frame slidably arranged externally to a lower end of said sandslinger head so as to be vertically displaceable from a lowered position in which said ramming frame projects downwardly from said sandslinger head to a raised position in which said ramming frame is retracted around said sandslinger head, and a flask supporting table arranged below said sandslinger head and provided with means for vertically displacing said flask supporting table towards said head, the improvement comprising said ramming frame having an inner wall formed by an inwardly projecting upper portion in slidable contact with the outer surface of the lower end of said sandslinger head and a recessed lower portion having air venting holes and spaced from said outer surface so that at least one air venting passage communicating with said holes is defined between said outer surfaces of said sandslinger head and said inner wall of said ramming frame when said ramming frame is in its raised position.

4,050,505

JARRING MOULDING MACHINE

Gert Kemper, Rossdorf, and Roland Melzer, Karlsruhe, both of Germany, assignors to Badische Maschinenfabrik GmbH, Germany

Filed May 5, 1975, Ser. No. 574,340
Claims priority, application Germany, May 10, 1974, 2422756
Int. Cl.² B22C *15/18*; B28B *1/08*
U.S. Cl. 164—206 **16 Claims**



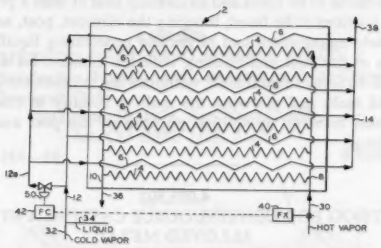
1. Jarring moulding machine having a table and an anvil member disposed for relative movement with respect to one another, an impact receiving means disposed between said table and a supporting surface of said anvil member, said impact receiving means comprising at least one impact member arranged in said supporting surface, for impact contact with said table resulting from this relative movement of the table and anvil member, and at least one impact insert which is resilient relative to the impact member and arranged in said impact member so that the impact insert receives impact contact with the table before the impact member.

4,050,506

STEPWISE TURNDOWN BY CLOSING HEAT EXCHANGER PASSAGEWAYS RESPONSIVE TO MEASURED FLOW

William M. Small, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 25, 1976, Ser. No. 670,214
Int. Cl.² F28F *13/00*
U.S. Cl. 165—1 **10 Claims**



1. A plate type heat exchanger apparatus comprising in combination:

a plurality of elongated metallic plates disposed in spaced relationship defining a plurality of elongated platelike passages in spaces there-between;

said plurality of passages including a first group of passages and a second group of passages, the passages of said first group being disposed in alternate relationship with said second group so as to be in heat exchange relationship therewith;

end means extending between said plates along the periphery thereof defining the width and length of said passages;

first inlet header communicating with said frist group of passages;

first outlet means for removing fluid from said first group of passages,

a second header means having associated therewith a sparger means for introducing a vapor into said second group of passages and sparging a liquid into said vapor, said second header means being divided into means to separately communicate with at least two fractions of the total number of passages in said second group of passages;

second outlet means for removing spent refrigerant from said second group of passages;

means to measure the flow of fluid to said first inlet header; and

means to shut off flow through a uniformly spaced fraction of the total number of passages in said second group of passages responsive to a signal generated by said means to measure flow.

4,050,507

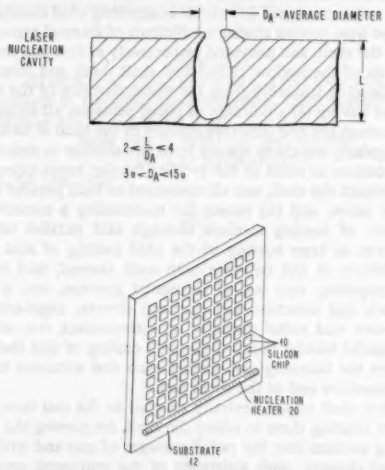
METHOD FOR CUSTOMIZING NUCLEATE BOILING HEAT TRANSFER FROM ELECTRONIC UNITS IMMERSED IN DIELECTRIC COOLANT

Richard C. Chu, Poughkeepsie, and Kevin P. Moran, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 27, 1975, Ser. No. 591,198

Int. Cl.[2] F28D *5/00*; F28F *13/18*

U.S. Cl. 165—1 **10 Claims**



1. A method of starting nucleate boiling at a predetermined temperature at nucleation sites on the walls of a unit to be cooled comprising:

drilling holes with a high energy beam to obtain an opening having a narrow top and opening up to a critical diameter then tapering off in diameter until a predetermined bottom or length is reached;

locating said holes in preselected positions on the walls to be cooled, the dimensions of said holes being selected to provide nucleate boiling at the predetermined temperature;

immersing the surface to be cooled in a dielectric liquid having a boiling point at the predetermined temperature;

orienting the walls to be cooled vertically in said dielectric liquid so that the nucleate boiling bubbles formed at said drilled holes when the surface reaches the predetermined temperature will wash liquid from the above located nucleation sites so that boiling will start at said predetermined temperature and thereby avoid temperature overshoot of the walls being cooled.

9. Apparatus for starting nucleate boiling at nucleate sites at a predetermined temperature comprising:

at least one electronic chip having nucleate boiling sites located on at least a back surface thereof and mounted so that the back surface is exposed and is oriented vertically,

a dielectric liquid covering at least the back surface of said electronic chip;

a pre-heater having nucleation sites therein located below said electronic chip for generating nucleate vapor bubbles which rise in said liquid and wash the liquid from the above located nucleate sites in said chip.

4,050,508

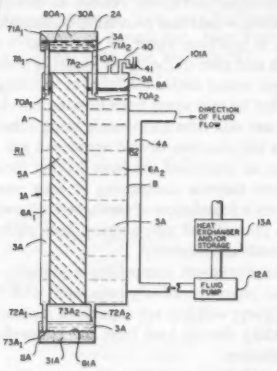
CONTROLLABLE HEAT TRANSMISSION PANELS

Bruce Shawn Buckley, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 28, 1975, Ser. No. 626,402

Int. Cl.[2] F24J *3/02*; F28D *21/00*

U.S. Cl. 165—32 **21 Claims**



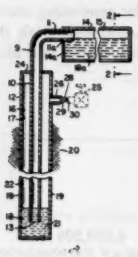
1. Apparatus for controlling energy transmission between two closely-spaced regions in a system, that comprises: an isolating structure disposed in the space between the two closely-spaced regions, a liquid disposed within said structure and adapted to flow or move therein, control means other than the character of the liquid itself responsive to a temperature parameter of the system and using only thermal energy acting to control automatically the movement of the liquid flow in said structure, said liquid, mostly by virtue of the convective properties of the liquid, using only thermal energy and without change of state thereof, acting to modulate the energy transmission between the two closely-spaced regions of the system, said isolating structure comprising a thermal insulator interposed between the two regions and serving to divide the isolating structure into a first section adjacent the first region of the two regions and a second section adjacent the second region of the two regions, said liquid being disposed within the first section and the second section and adapted to flow by convective flow from one to the other of the two sections, the control means acting to affect said convective flow; and a heat transfer mechanism that comprises fluid means whereby a fluid is caused to flow adjacent to said second section to exchange energy with the liquid in said second section.

4,050,509

DOWN-PUMPING HEAT PIPES

Walter B. Bienert, and Milton F. Pravda, both of Baltimore, Md., assignors to Dynatherm Corporation, Cockeysville, Md.

Filed Oct. 28, 1976, Ser. No. 736,548
Int. Cl.[2] F28D 15/00
U.S. Cl. 165—45 10 Claims



1. A down-pumping heat pipe comprising a pair of angularly disposed upper and lower vessels, an elongated tube enclosed in the lower vessel and providing communication between the vessels, a working agent in the lower vessel able to flow through said tube to the upper vessel, a non-condensible gas in the lower vessel above the level of working agent therein but prevented by said agent from flowing into said tube and upper vessel, and said tube and vessels being substantially evacuated prior to introduction of said agent and gas.

10. In an improved roadway having means for melting ice and snow thereon comprising at least one paving slab supported on a foundation of earth, and wherein said means comprise a plurality of up-pumping heat pipes operatively associated with the roadway,

the improvement comprising a plurality of down-pumping heat pipes operatively associated with the roadway which in warm weather are capable of replenishing earth heat by adding thereto heat from the atmosphere and from solar radiation,

each said down-pumping pipe comprising two vessels one of which is disposable in the grond below and/or adjacent to the roadway and the other of which is disposable in the roadway just below the surface thereof,

an inner tube enclosed by said ground vessel and in communication therewith and also with said roadway vessel, a quantity of noncondensible gas in the ground vessel,

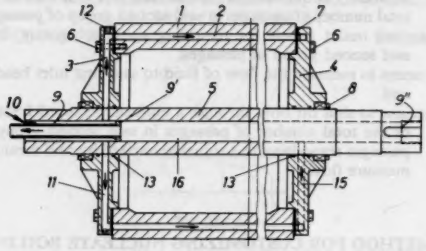
an amount of working agent in the down-pumping pipe which in warm weather is vaporizable in the roadway vessel by atmosheric and solar heat and is condensible in the ground vessel by the lower temperatures prevailing in the ground, the vaporized agent flowing from the roadway vessel through the tube to the ground vessel where it encounters said gas, at least part of the vaporized agent being condensed in the ground vessel, thereby releasing heat of condensation to walls of the ground vessel and the surrounding earth, and part of the vaporized agent mixing with said gas, thereby increasing the pressure of the resulting mixture, said mixture eventually receiving so much vaporized agent as to attain a pressure large enough to force condensed agent back to the roadway vessel where it may again be vaporized by the higher temperatures on the roadway surface, and said pipes being evacuated prior to introduction of said agent and gas.

4,050,510

CALENDER HEATING ROLL

Helmuth Theysohn, Wiehbergstrasse 25 C, 3 Hannover, Germany

Continuation of Ser. No. 463,825, April 24, 1974, abandoned. This application Nov. 28, 1975, Ser. No. 635,868
Claims priority, application Germany, Apr. 27, 1973, 2321367
Int. Cl.[2] F28F 5/02
U.S. Cl. 165—89 1 Claim



1. A heating calender roll, comprising;

a hollow cylindrical shell comprising a chill casting large enough to calender thereon a rubber-asbestos sheet having a length of several meters on each side thereof, the shell being of cast iron and having a plurality of parallel tubular bores extending through the cast iron of the hollow shell parallel to the axis of the shell at locations regularly distributed circumferentially of the shell;

first and second end structures comprising chill castings of cast iron, having similar coefficients of thermal expansion as the shell, and provided respectively at first and second ends of the hollow cylindrical shell, each end structure extending inwardly from the respective end of the shell, and having (a) a plurality of radial passages, all extending through the end structure radially of the shell at locations regularly angularly spaced from one another to match the locations of some of the parallel tubular bores extending through the shell, and all connected to such parallel tubular bores; and (b) means for maintaining a meandering flow of heating medium through said parallel tubular bores to keep heating of the chill casting of said shell uniform at and between both ends thereof, said means comprising two sets of segmental grooves, one set for each end structure and disposed therein, angularly between said radial passages, to interconnect two of said parallel tubular bores of the chill casting of said shell;

means for fastening and sealing each end structure to the respective end of the shell; and

hollow shaft means centrally secured to the end structures for rotating them to rotate the shell, for passing the heating medium into the radial passages of one end structure and thereby, with assistance of the segmental grooves, into the meandering flow through the parallel tubular bores of the shell, and for receiving the heating medium from the parallel tubular bores of the shell through the other end structure,

to heat the large chill casting of the shell by said medium, to similarly heat the chill castings of both end structures, and thereby to enable the shell to calender the rubber asbestos sheets.

4,050,511

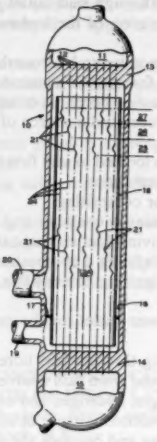
HEAT EXCHANGERS

Bertrand N. McDonald, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Mar. 3, 1975, Ser. No. 554,366
Int. Cl.[2] F28D 7/10
U.S. Cl. 165—162 4 Claims

1. A heat exchanger including a plurality of substantially

longitudinally aligned and spaced heat exchanger fluid flow tubes wherein at least some of said tubes each comprise a section thereof extending in the longitudinal direction of the tube and bent outwardly from the longitudinal tube axis in an



approximately helical shape about the longitudinal axis, said section being in continuous fluid flow relation with the remainder of the tube, and said section having longitudinally successive outwardly extending portions in tangential contact with at least some of the tubes adjacent thereto.

4,050,512

STROKE ACTUATED WELL TESTING TOOL

Bernhardt F. Giebeler, San Bernardino, Calif., assignor to BJ-Hughes Inc., Long Beach, Calif.

Filed July 6, 1976, Ser. No. 702,406
Int. Cl.² E21B *49/00*
U.S. Cl. 166—128 **6 Claims**

1. A tubing string supported well testing tool, comprising:

a. a tubular structure having a series of control subassemblies, each having components capable of limited relative axial movement;

b. a tubular packer suspended from the tubular structure and adapted to be set in a well core;

c. a first of the control subassemblies having radially directed ports, said ports occupying an open position during movement of the tubular structure and packer through the well bore to permit passage of well fluid through the packer into the region surrounding the tubing string, said ports occupying closed positions when the packer is set in the well bore;

d. a rotatable main valve within the tubular structure;

e. a second of the control subassemblies for moving the valve successively between a position closing flow through the tubular structure and a position permitting flow through the packer and tubular structure;

f. said second control assembly including a driven gear carried by the main valve, an annular gear carried within the walls of the tubular structure, a multiple cam cylinder having a drive gear engagable with the the driven gear, longitudinally and circumferentially extending cam elements, and longitudinally movable cam driving elements for turning the cam cylinder to effect rotation of the main valve;

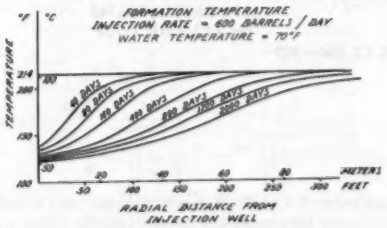
g. and a pressure counterbalancing means, operable when the main valve is closed and the well pressure below the main valve exceeds the pressure above, for applying a counter-force to facilitate movement of the main valve to its open position.

4,050,513

METHOD OF TREATING A HIGH TEMPERATURE FORMATION TO PERMIT THE USE THEREIN OF TEMPERATURE SENSITIVE HYDROPHILIC, VISCOSITY INCREASING POLYMERS

Ching H. Wu, Golden, Colo.; Alfred Brown, Houston, Tex.; Wann-Sheng Huang, Houston, Tex., and Yick-Mow Shum, Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed July 15, 1976, Ser. No. 705,737
Int. Cl.² E21B *43/22*
U.S. Cl. 166—274 **13 Claims**



1. In a method of recovering petroleum from a subterranean, petroleum-containing formation comprising injecting a viscous, aqueous fluid containing a hydrophilic, viscosity increasing polymer selected from the group consisting of polysaccharides, polyacrylamides, and mixtures thereof wherein the formation temperature exceeds the temperature at which the polymer is stable, wherein the improvement comprises:

introducing a cooling fluid into the formation at a temperature substantially lower than the temperature at which the polymer is stable for a period of time sufficient to reduce the portion of the formation to be contacted by the polymer to a temperature level at which the polymer is stable.

4,050,514

PARAFFIN SUCKER ROD SCRAPER AND ROD CENTRALIZER

Otto E. Prenn, Sherwood Park, Canada, assignor to The Steel Company of Canada, Limited, Hamilton, Canada

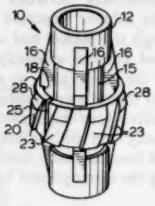
Filed Sept. 3, 1976, Ser. No. 720,253
Int. Cl.² E21B *37/02*
U.S. Cl. 166—176 **6 Claims**

1. A sucker rod scraper comprising:

a plastic body member adapted to be affixed to the sucker

rod, the body member including an elongated, generally cylindrical portion to concentrically surround the sucker rod, a plurality of longitudinal fins extending radially from said cylindrical portion and spaced angularly from each other, the fins being indented between their ends,

a plastic ring member adapted to encircle said body member



adjacent the fins, within the indentations of the fins, the ring member having an inner diameter greater than the outer diameter of the adjacent part of the cylindrical portion,

the ring member being retained adjacent the fins by virtue of the indentations, and being capable of rotation with respect to the body member.

4,050,515

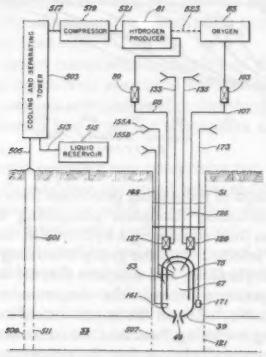
IN SITU HYDROGENATION OF HYDROCARBONS IN UNDERGROUND FORMATIONS

Joseph T. Hamrick, Roanoke, and Leslie C. Rose, Rocky Mount, both of Va., assignors to World Energy Systems, Fort Worth, Tex.

Continuation-in-part of Ser. No. 611,138, Sept. 8, 1975, Pat. No. 3,982,592, which is a continuation-in-part of Ser. No. 534,778, Dec. 20, 1974, Pat. No. 3,982,591. This application Sept. 27, 1976, Ser. No. 726,745

Int. Cl.[2] E21B *43/24*

U.S. Cl. 166—303 **12 Claims**



1. A process of hydrogenating hydrocarbons in underground formations penetrated by a borehole and wherein a gas generator is located in the borehole at or near the level of said formations, said gas generator comprising:

a housing forming a chamber defining a combustion zone and having an upper inlet end for receiving fuel and an oxidizing fluid for forming a combustible mixture of gases in said combustion zone for ignition, and

a restricted lower outlet for the passage of heated gases,

said process comprising the steps of: flowing through said borehole from the surface

to said gas generator, by way of separate

passages, hydrogen and oxygen to form a hydrogen-rich combustible mixture in said combustion zone, igniting and burning the combustible mixture

in said combustion zone, and

controlling the flow of hydrogen and oxygen to said gas generator to maintain the temperature of the gases and fluids flowing through said outlet at a level sufficient to cause hydrogenation of the hydrocarbons in said formations.

7. A system for recovering hydrocarbons or other materials from underground formations penetrated by a first borehole and a spaced production borehole comprising:

a hydrogen producer and a source of oxygen are located at the surface,

a gas generator is located in said first borehole at or near the level of said formations,

said gas generator comprising:

a housing forming a chamber and having an upper inlet end for receiving fuel and an oxidizing fluid,

said chamber defining a combustion zone,

an igniter for igniting combustible gases in said combustion zone,

a restricted lower outlet for the passage of heated gases, and

means for flowing through said borehole from said hydrogen producer and from said source of oxygen, by way of separate passages, hydrogen and oxygen to form a hydrogen-rich combustible mixture in said combustion zone,

means for igniting and burning the combustible mixture in said combustion zone,

means for controlling the flow of hydrogen and oxygen to said gas generator to maintain the temperature of the gases and fluids flowing through said outlet at a level sufficient to cause hydrogenation of the hydrocarbons in said formations,

means for recovering hydrocarbons from said production borehole, and

means for applying at least a portion of said hydrocarbons recovered, to said hydrogen producer for producing hydrogen for supplying hydrogen to said gas generator.

4,050,516

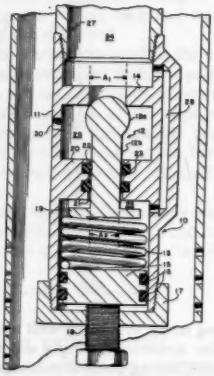
METHOD OF INJECTING FLUIDS INTO UNDERGROUND FORMATIONS

Robert Houston Canterbury, Hobbs, N. Mex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 555,778, March 6, 1975, Pat. No. 3,987,848. This application June 24, 1976, Ser. No. 699,280

Int. Cl.[2] E21B *43/25*

U.S. Cl. 166—305 R **9 Claims**



1. A method of injecting fluids into an underground formation penetrated by a wellbore, said method comprising:

predetermining the hydrostatic pressure of a column of fluid

having a height equal to the depth of the underground formation;

providing a continuously partially pressure-balanced injection valve having a resultant differential pressure area responsive to the hydrostatic pressure of a colume of fluid thereabove to open said valve, and having an adjustable biasing means arranged to apply a closing force to said valve;

adjusting said injection valve biasing means to a force exceeding the resultant differential pressure on said valve which would arise from said predetermined hydrostatic pressure;

locating said injection valve in a tubing string in the under ground formation;

placing in the tubing string treating fluid to be injected into the formation;

filling any remaining portion of the tubing string with displacement fluid; and,

applying fluid pressure to the tubing string to open said injection valve and inject said treating fluid into the formation.

4,050,517

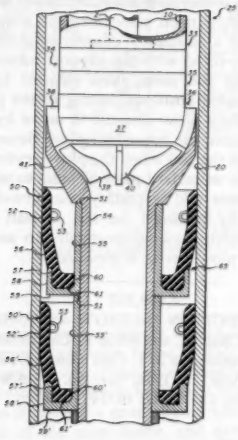
GEOTHERMAL ENERGY WELL CASING SEAL AND METHOD OF INSTALLATION

Hugh B. Matthews, Boylston, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 14, 1976, Ser. No. 732,262

Int. Cl.² E21B *33/126, 43/00;* F01K *23/00;* F03G *7/04*

U.S. Cl. 166—315 **10 Claims**



1. In geothermal deep well pump apparatus of the kind including deep well pump means having input means for pumping a first fluid always in liquid state through well casing means in cooperative energy exchanging relation with respect to a second fluid for producing a working fluid:

turbine means at said deep well pump means for driving said deep well pump means in response to said working fluid,

first conduit means for passage of said working fluid between said turbine means and the earth's surface,

said turbine means being suspended within said deep well by said first conduit means,

second conduit means affixed to said input means and extending downward therefrom,

resilient seal means disposed around said second conduit means normally in contacting sliding relation with said well casing means, and

tension means for retracting said resilient seal means from contact with said well casing means while said turbine means, said deep well pump means, and said resilient seal means are being lowered upon installation into said geothermal deep well.

10. The method of installing geothermal fluid pumping apparatus at an operating location within the casing of a geothermal well, said fluid pumping apparatus comprising turbine motor means, turbine working fluid conduit means extending from said turbine means to the earth's surface and supporting said turbine means, pump means driven by said turbine motor means, resilient seal means at the inlet of said pump means for normally contacting in sliding relation at the operating location of said fluid pumping apparatus the inner surface of said casing, including the steps of:

mounting said resilient seal means at said inlet of said pump means,

applying tension to said resilient seal means to retract it to a stowed position from its normal contacting position by employing tension means adapted to release said resilient seal means under at least one influence of said geothermal fluid when immersed therein,

lowering said fluid pumping apparatus into said well by said working fluid conduit means, whereby said tension means becomes immersed in said geothermal fluid, thereupon releasing said resilient seal means from its stowed position into its normal contacting, sliding relation with the inner surface of said casing.

4,050,518

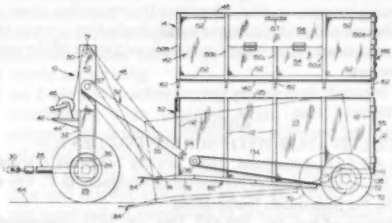
BEACH CLEANING APPARATUS

Richard C. Gilmour, 207 Weymouth Ave., Scullville, N.J. 08330

Filed July 1, 1976, Ser. No. 701,587

Int. Cl.² A01D *15/02*

U.S. Cl. 171—116 **11 Claims**



1. A beach cleaning apparatus comprising a forward assembly and a trailer member operatively connected thereto, said forward assembly comprising a body portion, means on the forward portion of said body portion for securing the beach cleaning apparatus to a motorized vehicle, and first rotatable means extending transversely of said body portion for rollably supporting said forward assembly on the ground; said trailer member comprising a bed comprising screen means adjacent the forward end thereof and having ground engaging means extending outwardly of said forward end, upstanding walls extending about the periphery of and mounted to said bed with the lower edge of the wall portion disposed adjacent said forward end of said bed beng spaced upwardly therefrom to provide a transversely extending opening, and second rotatable means extending transversely of the rear portion of said trailer member for rollably supporting said trailer member on the ground; and lift means operatively interconnecting the forward portion of said trailer member to said forward assembly for raising and lowering the forward portion of said trailer member to disengage and engage said ground engaging means with sand to be cleaned whereby engaged sand passes over said ground engaging means as the beach cleaning apparatus moves forwardly, through said opening and onto said screen means where it undergoes a sifting action to remove debris therefrom, the sand thereafter passing downwardly through said screen means onto a beach or the like.

4,050,519

SOIL CULTIVATING MACHINES

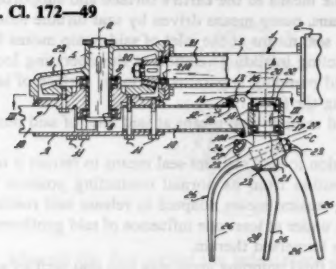
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed Oct. 9, 1975, Ser. No. 620,920

Claims priority, application Netherlands, Oct. 10, 1974, 7413313

Int. Cl.² A01B *33/06, 33/14*

U.S. Cl. 172—49 **15 Claims**



8. A soil-cultivating machine comprising a frame and at least one soil-working member being supported on said frame, said soil-working member being rotatable about at least one upwardly extending rotary axis and driving means connected to rotate said soil-working member about that axis, cultivating means being rotatable mounted on said soil-working member and spaced from said rotary axis, sid cultivating means being freely rotatable about a further, upwardly extending axis that is defined by a shaft, said cultivating means comprising a plurality of tines having elongated upper ends that extend upwardly, means adjusting the relative position of said shaft and the working position of said cultivating means, said soil-cultivating means comprising a plurality of arms that are inclined downwardly and away from said shaft, the outer free ends of said arms having corresponding downwardly extending tines secured thereon and said ajustment means including a pivot that is positioned nearer said rotary axis than said shaft of the cultivating means.

4,050,520

CULTIVATOR WITH SCREENING DEVICE

Ary van der Lely, Maasland, and Cornelis Johannes Gerardus Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N. V., Maasland, Netherlands

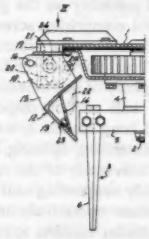
Continuation of Ser. No. 208,687, Dec. 16, 1971, abandoned. This application Jan. 26, 1976, Ser. No. 652,098

Claims priority, application Netherlands, Dec. 21, 1970, 7018555

The portion of the term of this patent subsequent to Nov. 27, 1990, has been disclaimed.

Int. Cl.² A01B *33/06*

U.S. Cl. 172—59 **15 Claims**



1. A cultivator having an elongated frame and a plurality of rotatable soil working members arranged in a transverse row, said soil working members being rotatable about upwardly extending axes and comprising downwardly extending tines mounted on supports, said supports with tines being in driving connection and rotated by driving means, screening means pivotably connected to said frame and extending substantially horizontally along the front of said frame relative to the direction of travel, a lower portion of said screening means during operation being located directly in front and adjacent the connections of said tines to their respective supports in the foremost positions thereof, said screening means being turnably connected to said cultivator with substantially horizontal pivots, spring means interconnecting said screening means with said frame and biasing said screening means to an operative protective position, a front side of said screening means affording a surface that engages the soil during operation and includes a portion that extends downwardly and rearwardly protecting the front of said frame and the connections of said tines with their supports from debris in and on the soil that would be encountered by the rotating tines during operation.

4,050,521

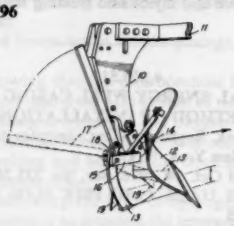
COMBINED TURNPLOW AND SUBSOILER

Robert A. Rowan, P.O. Box 68, Enigma, Ga. 31749

Filed July 12, 1976, Ser. No. 704,302

Int. Cl.² A01B *11/00, 13/14*

U.S. Cl. 172—196 **6 Claims**



1. A plow device comprising a support means adapted to be raised and lowered, a main plow element attached to the support means, and a secondary counterweighted plow element movably connected with the support means and being shiftable relative to the main plow element to and from retracted and extended positions, raising of the plow device causing the secondary plow element to move by gravity to said retracted position, the secondary plow element having a part which contacts the soil when the plow device is lowered thereby moving the secondary plow element to said extended position, and wherein said secondary counterweighted plow element is pivotally mounted on the support means and swingable on its pivot axis automatically to said retracted position when the plow device is elevated.

4,050,522

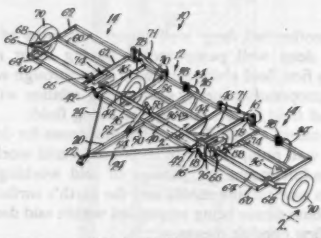
MULTI-SECTION HARROW ASSEMBLY

Harold A. Ralston, Racine, and Alton B. Christensen, Kenosha, both of Wis., assignors to J. I. Case Company, Racine, Wis.

Filed Mar. 29, 1976, Ser. No. 671,626

Int. Cl.² A01B *15/14, 24/04*

U.S. Cl. 172—311 **8 Claims**



1. In a harrow assembly including a center main frame section and a pair of outer wing sections pivoted on the outer ends of said main frame section for articulated movement about hinge axes extending fore and aft of the path of travel of the assembly, a main shaft journaled for rotation on said main frame section about an axis extending transversely of a fore and aft path of travel of the assembly, a pair of wing shafts rotated on the respective wing sections and axially aligned with said

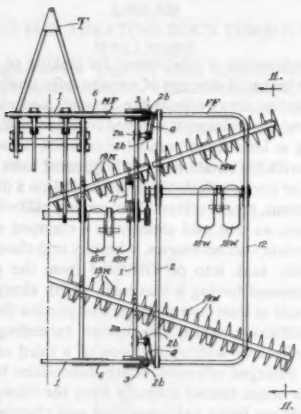
main shaft when said sections are in end-to-end relation, means for rotating said main shaft on said main section, and connection means between said main shaft and said wing shafts for rotating said wing shafts with said main shaft, the improvement of each of said connection means including a first arm fixed to said main shaft and extending generally rearwardly with respect to said main shaft, said first arm having a downwardly directed convex, generally arcuate elongated surface defined thereon with a lowermost edge of said surface being vertically aligned with a fore and aft axis, and a second arm fixed to an adjacent end of a wing shaft and extending generally rearwardly with respect to said wing frame, said second arm having an elongated upwardly directed surface adapted to engage said arcuate surface along a line of contact between said surfaces defining extended surface contact which is generally aligned with said fore and aft axis when said assembly is in a normal earthworking position.

4,050,523

FOLDING WING DISC HARROW

Robert L. Poland, Kewanee, Ill., assignor to Chromalloy American Corporation, St. Louis, Mo.

Filed Sept. 18, 1975, Ser. No. 614,372
Int. Cl.² A01B *49/00, 63/32*
U.S. Cl. 172—311 **11 Claims**



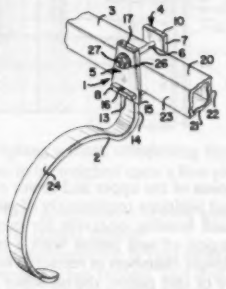
1. In an agricultural implement having a horizontally disposed tool supporting main frame, a tool supporting wing frame hinged to one side of the main frame to swing on a fixed hinge axis between a generally horizontal inverted rest position over the main frame and a generally horizontal working position outboard of the main frame, and extensible-retractable push-pull means to effect said swinging of the wing frame, the improvement wherein the wing frame is hinged to the main frame by a compound hinge connection which includes a lever having one end hingedly connected to the main frame to swing on said fixed hinge axis and having its opposite end hingedly connected to the wing frame to swing on a second hinge axis speced from said fixed hinge axis and parallel thereto, said compound hinge connection further including a thrust link pivotally connected to said level intermediate its hingedly connected ends, the thrust link being also pivotally connected to one end of the push-pull means, and a second link having one end pivotally connected to the wing frame, said second link containing a closed longitudinally extending slot spaced from its pivotal connection to the wing frame, the thrust link having an anchor pin slidably confined in said slot such that the wing frame when in its generally horizontal working position is free to swing within a limited angle about the second hinge axis to follow field contour, the outboard end of the slot in the second link being engaged by the anchor pin of the thrust link to retain the wing frame against rotation about the second hinge axis when the load of the wing frame is outboard of the second hinge axis as the lever is swung upwardly about the fixed hinge axis by the thrust link under the force of the push-pull means to raise the wing frame out of its working position, the thrust link further having means which capture the outboard end of the second link to resist rotation of the wing frame on said second hinge axis in the opposite direction as the load of the wing frame approaches and moves inboard of a vertical through said second hinge axis as the push-pull means acts on the hinge lever through the thrust link to lower the wing frame about said fixed hinge to its rest position over the main frame.

4,050,524

CULTIVATOR TOOTH CLAMP

Kenneth A. Hake, Tipton, Kans., assignor to Kent Manufacturing Co., Inc., Tipton, Kans.

Filed May 17, 1976, Ser. No. 687,311
Int. Cl.² A01B *23/02*
U.S. Cl. 172—707 **7 Claims**



1. A clamp for mounting an agricultural implement to a square section tool bar, said implement being at times subject to transverse force components parallel to said bar and having a substantially planar mounting shank with opposite side edges, said clamp comprising:

a. an L-shaped bracket having planar legs disposed at substantially a right dihedral angle, said bracket being adapted for mounting on said bar with said legs engaging adjacent sides thereof;

b. one of said legs having an elongated shank slot adjacent a free end thereof and sized to closely receive said shank, the longitudinal dimension of said slot extending parallel to the dihedral vertex common to said legs;

c. retaining clip adapted to engage said shank and having an elongated key slot adjacent one end thereof and sized to closely receive said one leg free end, said clip being mounted with said one leg free end recived in said key slot; and

d. fastening means for joining said bracket, clip, and shank to said bar in clamped engagement thereby resisting the pivoting of said implement about a horizontal axis perpendicular to said bar.

4,050,525

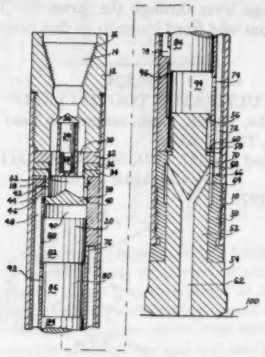
DOWN-THE-HOLE HAMMER

John F. Kita, Bedford, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Filed Sept. 2, 1976, Ser. No. 720,057
Int. Cl.² B23Q *5/027*
U.S. Cl. 173—17 **7 Claims**

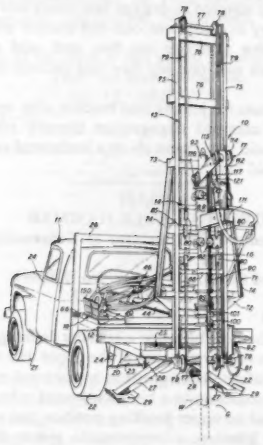
1. In a down-the-hole hammer; a housing defining a cylindrical cavity and having first means at the upper end for connection to a source of air under pressure and second means at the lower end for connection to a bit having axial exhaust passage means therein and an upper working position and a lower idle position in said housing, a reciprocable piston dividing the cavity into upper and lower chambers and having retracted and advanced positions in the cavity and adapted in advanced position to strike the upper end of a bit in working position in the housing, said piston having end portions fitting said cavity

and a reduced diameter region between said end portions, first conduit means in the housing adapted for the continuous supply of air under pressure thereto, second conduit means in the housing continuously connected to exhaust, first port means connecting said first conduit means to the reduced diameter region of said piston, second and third axially spaced port means leading from said second conduit means into said cavity, said piston controlling said second and third port means and causing said second and third port means to communicate with



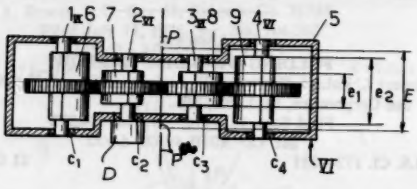
respective ones of the upper and lower chambers in advanced and retracted positions respectively of said piston, and channel means in said housing operable for connecting the reduced diameter region of said piston with a respective one of said upper and lower chambers in retracted and advanced positions respectively of said piston, the bit when in idle position in the housing permitting the piston to advance beyond said advanced position thereof and cause said reduced diameter region of said piston to interconnect said first port means and said seond port means thereby exhausting said first conduit means.

4,050,526
POST DRIVING MACHINE
Robert F. Deike, Cheyenne, Wyo., assignor to Foresight Industries, Cheyenne, Wyo.
Filed May 7, 1975, Ser. No. 575,462
Int. Cl.[2] E21C *11/02*
U.S. Cl. 173—27 **16 Claims**



5. In a post driving machine having a hammer for delivering impact blows to a work piece to be driven into the ground, the improvements which comprise a tension spring linked to said hammer to provide the sole driving force for propelling said hammer, hydraulic means for loading said spring, a hydraulic circuit feeding hydraulic fluid to said hydraulic means to control loading and unloading of said spring, and a manually controlled adjustment means for said hydraulic circuit regulating the dumping of said hydraulic fluid to vary the stroke of said hammer.

4,050,527
VIBRODRIVER APPARATUS
Jean L. Lebelle, 92210 Saint Cloud, France
Filed Apr. 13, 1976, Ser. No. 676,507
Claims priority, application France, Apr. 23, 1975, 75.12622
Int. Cl.[2] E02D *7/18*
U.S. Cl. 173—49 **8 Claims**

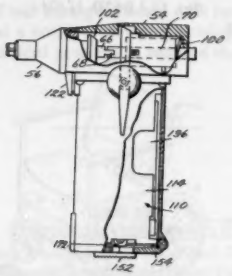


1. In combination, a vibrodriver for sinking or extracting a vertically elongated element of substantially uniform horizontal cross-section into or from the ground, said element being one of plural such elements arrayed in a line, said vibrodriver comprising at least three parallel eccentrics, means mounting said eccentrics for rotation about horizontal axes, at least two eccentrics or portion thereof being situated on a different sides of said element, means releasably clamping said vibrodriver on said element, so that said element is a clamped element, and means to rotate said eccentrics, whereby said clamped element is vibratorily sunk into or extracted from the ground, said clamped element having a maximum width along said line of elements, said at least two eccentrics or portion thereof having enlarged effective width dimensions exceeding the corresponding effective width dimension of a third of said eccentrics, said enlarged effective width dimensions being accommodated at zones spaced laterally from the clamped element, said vibrodriver being narrower than said clamped element at the zone adjacent said clamped element so that the vibrodriver has increased power due to the enlarged effective width dimensions yet will be clear of elements adjacent the clamped element.

4,050,528
WIRE INSERTER
Carl L. Foltz, Holiday; Vernon H. Troutner, Petersburg, and Arthur F. Trott, Largo, all of Fla., assignors to Concept, Inc., Clearwater, Fla.
Continuation-in-part of Ser. No. 610,869, Sept. 5, 1975. This application Oct. 17, 1975, Ser. No. 623,391
Int. Cl.[2] AG1B *17/18*
U.S. Cl. 173—163 **14 Claims**

1. A portable surgical wire inserting instrument comprising a housing, said housing defining a handle and a drive casing, a removable cassette comprising motor means, switch means and a source of electrical power, mounted in said housing and completely enclosed within said housing handle, said motor means mounted in said cassette, said electrical source of power mounted in said cassette and adapted to power said motor means when electrically connected to said motor means by said cassette switch means enclosed within said cassette, a wire holding tube means mounted in said housing, said wire holding tube means being provided with chuck means at one end, the

chuck means being adapted to grab and hold a wire inserted in said wire holding tube in a fixed position, gear means connecting said motor means to said wire holding tube means adapted to rotate said wire holding tube means and external switch



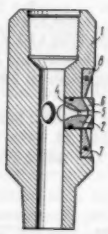
means movably mounted on said housing, said external switch means being connected to said cassette switch means and adapted to engage said cassette switch means to engage said motor means.

4,050,529

APPARATUS FOR TREATING ROCK SURROUNDING A WELLBORE

Kurban Magomedovich Tagirov, ulitsa Lenina, 408a, kv. 25; Nikolai Rubenovich Akopian, ulitsa Sochinskaya, 64; Valery Vasilievich Konontsev, ulitsa Serova, 181, and Jury Nikolaevich Lutsenko, ulitsa Lenina, 472, kv. 15, all of Stavropol, U.S.S.R.

Filed Mar. 25, 1976, Ser. No. 670,347
Int. Cl.² E21B 7/11
U.S. Cl. 175—422 **22 Claims**



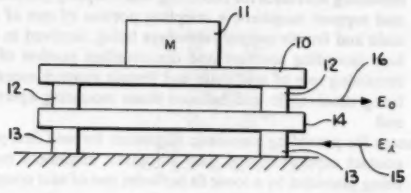
1. An apparatus for treating rock surrounding a cased wellbore, comprising: a hollow elongated housing; a plurality of nozzles radially arranged in said housing, and being mounted therein for free reciprocating movement from the center portion of said housing to the periphery thereof so as to project exteriorly of said housing; each said nozzle having a through passage communicating with the internal space of said housing for a flow therethrough of an abrasion laden fluid; said nozzles having their end portions facing exteriorly of said housing and being adapted to closely fit the casing wall, each said through passage of said nozzles having a larger diameter portion adjacent to said end portion; each said nozzle having additional passages one end of which communicating with said larger diameter portion of said through passage and the other end communicating with the space exteriorly of said nozzle, and said additional passages being adapted to provide an outflow of the abrasion laden fluid from the space defined by said larger diameter portion of said through passage and the adjacent casing wall, as said nozzles are pressed against said casing wall by said fluid; whereby said nozzles generally protect said casing from being washed away by said abrasive fluid, and enables perforating an opening in said casing of a diameter equal to about the diameter of said larger diameter portion and also provides where applicable for the utilization of substantially all of the kinetic energy of the flowing abrasive fluid for hydrofracturing of a formation without the need of packers.

4,050,530

METHOD AND APPARATUS FOR DETERMINING WEIGHT AND MASS

Anthony Storace, Tarrytown, N.Y., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed May 14, 1976, Ser. No. 686,475
Int. Cl.² G01G 3/14; G01N 29/00
U.S. Cl. 177—1 **22 Claims**



5. A method of weighing a mass, comprising the steps of:

A. supporting a mass to be weighed upon a first piezoelectric crystal means;

B. supporting said first piezoelectric crystal means upon a second piezoelectric crystal means;

C. causing said second piezoelectric crystal means to vibrate by applying an input voltage thereto, said first piezoelectric crystal means also being caused to vibrate at a frequency substantially corresponding to that of the second piezoelectric crystal means, said first piezoelectric crystal means providing an output voltage when it is caused to vibrate; and

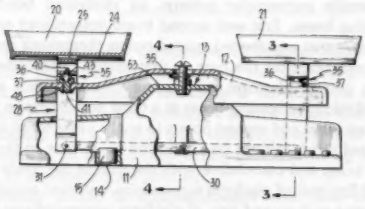
D. measuring the output voltage of the first piezoelectric crystal means in order to determine the weight of the mass being supported by the first piezoelectric crystal means.

4,050,531

BEAM BALANCE WEIGHING SCALE WITH SELF-ALIGNING POINT CONTACT SUPPORT ELEMENTS

Clifford Logan Ashbrook, 7500 Callaghan Road, San Antonio, Tex. 78229

Filed Feb. 12, 1976, Ser. No. 657,672
Int. Cl.² G01G 21/08, 1/24
U.S. Cl. 177—198 **23 Claims**



1. A beam balance weighing scale comprising:

a base having a fulcrum region extending transversely thereof;

a beam balance adapted to be supported on said base in said fulcrum region for oscillatory motion thereon;

first means for providing point contact support for said beam balance on said base, said first point contact support means including first and second pairs of mating members, each said pair being alternately spaced along said fulcrum re-

gion, each said pair comprising a male support member having a centrally arranged longitudinally extending portion tapering inwardly toward one end thereof and terminating in a rounded point having a first radius of curvature, and a coupling portion extending in a generally opposite direction from said one end; and a female support member having a coupling portion extending in a first direction and a body portion with a centrally arranged recess facing in a direction generally opposite from said first direction for receiving said rounded point, said recess having a radius of curvature greater than the radius of curvature of said rounded point;

said base and said balance beam each being provided with mounting apertures for receiving said coupling portions of said support members, a coupling portion of one of said male and female support members being received in said base mounting aperture and the coupling portion of the remaining one of said male and female support members being received in said balance beam mounting aperture; and

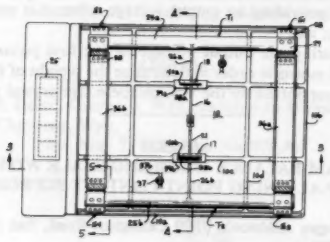
means for providing automatic alignment for said first point contact support means, said automatic alignment means being provided by a loose fit between one of said coupling portions of each of said pair and the corresponding mounting aperture.

4,050,532

PLATFORM TYPE WEIGHING SCALE

Mike A. Provi, and S. Robert Guinter, both of Rockford, Ill., assignors to The Brearley Company, Rockford, Ill.

Filed June 30, 1976, Ser. No. 701,114
Int. Cl.[2] G01G 3/14
U.S. Cl. 177—211 **14 Claims**



1. In a platform type weighing scale including a base and a scale platform, first and second pairs of platform suspension for mounting the platform on the base at the four corners of a generally rectangular pattern, an elongated bendable load sensing beam, first and second beam suspensions engagin the beam at first and second spaced points therealong and supporting the beam on the base, a first means interconnecting said first pair of platform suspensions to each other and to the bendable load sensing beam at a third point thereon intermediate said first and second points to apply a first force to the beam at said third point in one direction transverse to the length of the beam and correlative with the sum of the loads applied to said first pair of platform suspensions, a second means interconnecting said second pair of platform suspensions to each other and to the bendable load sensing beam at said third point thereon to apply a second force to the beam at said third point in said one direction transverse to the length of the beam and correlative with the sum of the load applied to said second pair of platform suspensions, and electrical strain gauge means mounted on said load sensing beam for producing an electrical signal correlative with the bending stress produced in said beam by the sum of said first and second forces acting thereon at said third point on the beam.

4,050,533

POWERED WHEEL CHAIR

Woodrow Seamone, Rockville, Md., assignor to Government of the United States of America rep. Administration of Veterens Affairs, Washington, D.C.

Filed June 22, 1976, Ser. No. 698,688
Int. Cl.[2] B62D 11/04
U.S. Cl. 180—6.5 **8 Claims**

1. In a powered wheel chair for providing transportation to human passengers including drive wheels rotatably mounted on said wheel chair, said drive wheels being independently powered by electric motors, said improvement comprising:

handrim means flexibly mounted on said wheel chair drive wheels for providing relative angular displacement to the drive wheels upon the application of torque thereto;

transducer means, responsive to said relative angular displacement, for providing an electrical output which is a function of torque applied to said handrim means; and

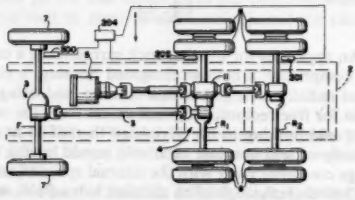
controller means, responsive to said transducer means electrical output, for providing electric power to said electric motors.

4,050,534

DRIVE AXLE SYSTEM USEABLE IN 6 × 6 VEHICLE

Robert K. Nelson, Shaker Heights, and James F. Mueller, Lakewood, both of Ohio, assignors to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 549,592, Feb. 13, 1975, abandoned. This application July 23, 1976, Ser. No. 708,445
Int. Cl.[2] B60K 17/16
U.S. Cl. 180—24.09 **10 Claims**



1. A tandem axle drive system operable to transmit torque from a vehicle transmission to first and second rear drive axles and a front drive axle, said drive system comprising:

a. means for dividing input torque received from said transmission, said torque dividing means including first and second torque transmitting means, said first torque transmitting means receiving substantially one-half of said input torque under ideal operating conditions and said second torque transmitting means receiving the remainder of the input torque;

b. first gear means in driving engagement between said first torque transmitting means and first rear drive axle;

c. second gear means in driving engagement between said

second torque transmitting means and said second rear drive axle;

d. third gear means in engagement with said first gear means;

e. shaft means operable to be in driving engagement between said third gear means and said front drive axle; and

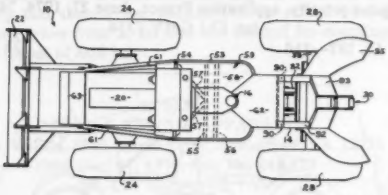
f. clutch means shiftable between a position permitting free running of said third gear means with respect to said shaft means, and a position providing driving engagement between said third gear means and said shaft means.

4,050,535

ARTICULATED VEHICLE

John H. Bosshart, Cambridge-Galt, and Emil J. David, Thunder Bay, both of Canada, assignors to Eaton Yale Ltd., Canada

Filed Mar. 5, 1976, Ser. No. 664,230
Int. Cl.² B62D *53/00*
U.S. Cl. 180—51 **5 Claims**



1. In an articulated vehicle having a first frame, and a second frame pivotally connected to said first frame about a substantially vertical axis of articulation: a canopy structure mounted on said first frame and defining an operator's station, first and second hinge assemblies defining said axis of articulation, said first hinge assembly comprising a first upper hinge plate attached to and supported by said canopy structure above said operator's station, a second upper hinge plate mounted on said second frame and a pin member connecting said hinge plates for rotation about said axis of articulation, and said second hinge assembly comprising a first lower hinge plate mounted at or adjacent the extreme lower end of said first frame, a second lower hinge plate mounted at or adjacent the extreme lower end of said second frame, and a pin member connecting said hinge plates for rotation therebetween about said axis of articulation.

4,050,536

POWER DRIVE SYSTEM

David J. Pristash, 930 Greener Place, Fairview, Pa. 16415

Filed Feb. 25, 1976, Ser. No. 661,290
Int. Cl.² B60K *3/00, 13/06*
U.S. Cl. 180—66 B **5 Claims**

1. A vehicle comprising a frame, axles on said frame connected to wheels, air motors connected to each said axle, said frame defining and forming an essentially air tight enclosure,

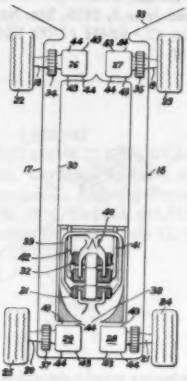
an air reservoir in said enclosure,

an engine and an air compressor in said enclosure,

said air compressor being connected to drive air into said reservoir,

said engine having an exhaust directed into said compressor,

and means to admit air into said enclosure between said reservoir and said frame for directing air to said engine



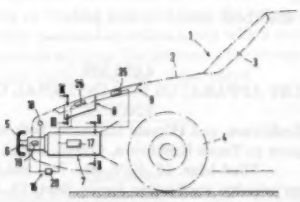
and to said air compressor, and means connecting said reservoir to said air motors.

4,050,537

INSTALLATION FOR THE ENERGY ABSORPTION OF VEHICLES

Ulrich Bez, Gerlingen, Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Germany

Filed Dec. 20, 1974, Ser. No. 534,789
Claims priority, application Germany, Dec. 22, 1973, 2364300
Int. Cl.² B60R *21/00*
U.S. Cl. 180—91 **15 Claims**



1. An energy absorbing installation for vehicles comprising:

means for increasing the denting and buckling stength of a vehicle body member including a deformation means having a wall structure defining a hollow space, and being associated with a vehicle body member, the vehicle body member in its undeformed configuration defining a portion of a vehicle body profile;

pressurizing means in communication with said hollow space for generating an increase in pressure within said space sufficient to outwardly deform said wall structure and said body member; and

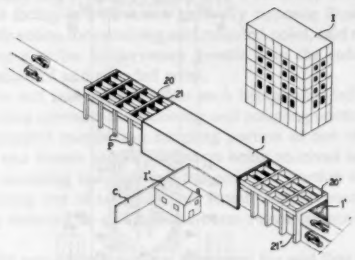
triggering means operatively connected to said pressurizing means and responsive to a vehicle collision for actuating said pressurizing means and thereby increasing the denting and buckling strength of said vehicle body member, and accordingly the energy absorbing ability by virtue of the changed shape produced.

4,050,538

NOISE REDUCING SCREEN

André L. Desenfant, Bures sur Yvette, France, assignor to Societe d'Etudes Generales de Communications Industrielles et Civiles-Segic, Rungis, France

Filed June 5, 1975, Ser. No. 583,911
Int. Cl.[2] E04H 17/00; E04B 1/82
U.S. Cl. 181—210 4 Claims



1. A noise reducing screen disposed between an elongated noise source and a building having a continuous wall portion to be shielded from the noise source and located along one side of the elongated noise source;

said noise reducing screen comprising:

a continuous wall portion having a whole length $2d$ which is built up between said elongated noise source and said building on both sides of a perpendicular drawn from the building point which is the most remote from the noise source and is located at a distance D therefrom to said elongated noise source;

a plurality of variably spaced apart posts aligned with said wall portion;

said posts having a length a and a width b respectively parallel and perpendicular to said elongated source;

the spacing between the n^{th} and $(n-1)^{th}$ post being at most equal to

$dp^n + (a-d)p^{n-1}$ with $n \leqq 2$ (and $n=1:dp$) where p is the ratio $D/(D-b)$;

whereby all rectilinear noise propagation paths from said noise source to said building are intercepted by said posts; and

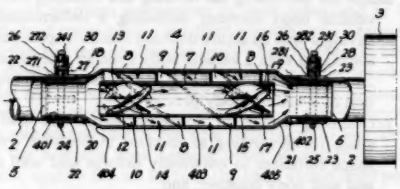
noise absorbent means on said posts.

4,050,539

EXHAUST APPARATUS FOR INTERNAL COMBUSTION ENGINE

Teruo Kashiwara, and Hiroshi Ichimaru, both of Osaka, Japan, assignors to Teruo Kashiwara, Osaka, Japan

Filed Mar. 15, 1976, Ser. No. 666,638
Claims priority, application Japan, Sept. 13, 1975, 50-111497
Int. Cl.[2] F01N 1/12, 1/00
U.S. Cl. 181—280 7 Claims



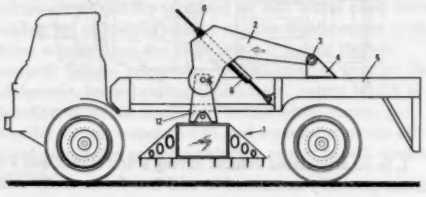
1. Exhaust apparatus for use with internal combustion engines, comprising an outer pipe provided with opposite end portions having diameters nearly the same as that of the engine exhaust pipe, an intermediate portion having a diameter larger than that of said end portions, the respective opposite ends of the outer pipe being joined to said intermediate portion by a pair of oppositely directed tapered sections, an inner pipe contained within said intermediate portion and having a diameter substantially the same as that of said exhaust pipe, said inner pipe being disposed concentrically with respect to the outer pipe and in axial alignment with said exhaust pipe, the respective end margins of the inner pipe being spaced from the inner walls of said tapered sections to provide two parallel concentric spaces for gases moving between said opposite end portions of the outer pipe, means defining a plurality of parallel helical passages extending longitudinally between said end portions in the space between said inner and outer pipes, and at least two groups of helically disposed fins within said inner pipe and positioned respectively near the respective ends thereof.

4,050,540

MOVABLE DEVICE FOR GENERATING ACOUSTIC SHEAR WAVES IN THE EARTH

Jacques Cholet, Rueil-Malmaison, and Pierre-Claude Layotte, La Palmyre, both of France, assignors to Institut Francais du Petrole, France

Filed June 24, 1975, Ser. No. 589,676
Claims priority, application France, June 27, 1974, 74.22569
Int. Cl.[2] G01V 1/14
U.S. Cl. 181—114 25 Claims



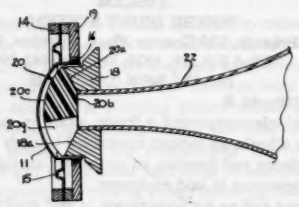
1. A device for generating seismic shear waves in the earth comprising a mobile supporting structure to which are secured a target-member having a surface of contact with the earth, a mass for striking the target-member and means for imparting to said mass a speed having a component parallel to said contact surface, including a rigid support-member orientable with respect to said supporting structure, an elongate rigid member supporting the mass at an end thereof and automatic means for moving the mass by rotation of said rigid member with respect to said support-member.

4,050,541

ACOUSTICAL TRANSFORMER FOR HORN-TYPE LOUDSPEAKER

Clifford A. Henricksen, Yorba Linda, Calif., assignor to Altec Corporation, Anaheim, Calif.

Filed Apr. 21, 1976, Ser. No. 678,873
Int. Cl.[2] G10K 11/06
U.S. Cl. 181—159 12 Claims



1. An acoustical transformer for coupling sound from a

dome shaped speaker diaphragm to the planar throat of a horn comprising a member having

a dome shaped surface having a curvature corresponding to that of said diaphragm,

a surface opposite said dome shaped surface having a truncated conical shape,

a central plug portion,

a plurality of radial slots formed in said member, said slots being spaced from each other around said member and extending through said member between the opposite surfaces thereof, running from said plug radially outwardly to the outer edges of said member,

sections of said member being formed between said slots, the opposite wall surfaces of adjacent member sections having an essentially exponential curvature, said slots forming essentially exponentially tapered sound channels, the sound entry end of said channels being along said dome shaped surface, the sound exit end of said channels being along the truncated end of said opposite surface, said truncated end being planar, the distances between corresponding points along the wall surfaces at the entry ends and the exit ends of said channels being substantially equal,

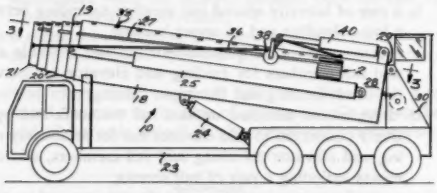
whereby sound waves generated by said diaphragm having a spherical wave front and entering the channels at the entry end thereof are transformed to waves having a planar wave front at the exit end thereof for coupling to the throat of said horn.

4,050,542

MOBILE RESCUE APPARATUS

Virgil D. Wilson, 8720 Selger Drive, Springfield, Va. 22153

Filed Dec. 17, 1975, Ser. No. 641,670
Int. Cl.[2] A62B 1/20, 1/02
U.S. Cl. 182—10 **11 Claims**



1. A mobile rescue assembly comprising

an elongated chute adapted to be brought into operative association with a high-rise building or the like and adapted to receive an individual therein for removal from said building or the like, said chute having an open top and an open bottom, and

means for controlling the descent of an individual in said chute so that the individual will be slowed down and stopped when he approaches the bottom of the chute without injury to him, said descent controlling means including

cable means mounted to said chute and having a pair of opposed cable sections extending from the top of said chute to the bottom thereof, portions of said cable sections at the top of said chute being relatively closely spaced with respect to each other,

means located at the bottom of said chute for mounting portions of said cable lengths thereat in a relatively widely spaced position so that said cable lengths flare outwardly from the top of said chute to the bottom of said chute, so that an individual sliding down said chute in a device operatively engaging said cable sections will be slowed down automatically as the bottom of said chute is approached,

operator controlled means for moving the portions of said cable sections at the open bottom of said chute with respect to each other to control the amount said cable sections are flared with respect to each other and thereby the rate of descent of an individual sliding down said chute, and

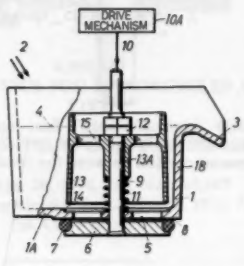
means for receiving an individual therein within said chute, said receiving means having readily detachable fastening means for connecting said receiving means to said cable means.

4,050,543

LUBRICATING DEVICE FOR GEARS

Wolfgang Schulz, Munich, Germany, assignor to Carl Hurth Maschinen- und Zahnradfabrik, Munich, Germany

Filed May 28, 1976, Ser. No. 691,015
Claims priority, application Germany, July 11, 1975, 2531029
Int. Cl.[2] F01M 9/00
U.S. Cl. 184—6.3 **3 Claims**



1. A lubricating device for gears and the like in starting condition comprising a lubricant storage tank, which is filled during operation and emptied prior to or during the starting of the gear unit, with an automatic emptying device by means of a valve, in pregiven amounts wetting at least one of the gears to be lubricated, comprising the improvement wherein a storage tank which is open toward the lubricating place is closed off by the valve which can be opened during the starting condition, which valve is combined with a bell, ring or the like, which holds the one-time lubricating amount, the lower edge of which bell, ring or the like is spaced from the bottom of the tank when the valve is closed tq define a gap which surrounds the discharge openings adjacent the bottom of the storage tank, which gap is closed during opening of the valve.

4,050,544

LUBRICATION SYSTEM FOR AN AIR MOTOR

Jagdish C. Kalyan, 822 NE. 62nd, Seattle, Wash. 98155, and Bryan J. Dickinson, 24219 Marine View Drive, Des Moines, Wash. 98016

Continuation-in-part of Ser. No. 465,862, May 1, 1974, abandoned. This application Dec. 8, 1975, Ser. No. 638,850
Int. Cl.[2] F01M 1/04
U.S. Cl. 184—6.6 **6 Claims**

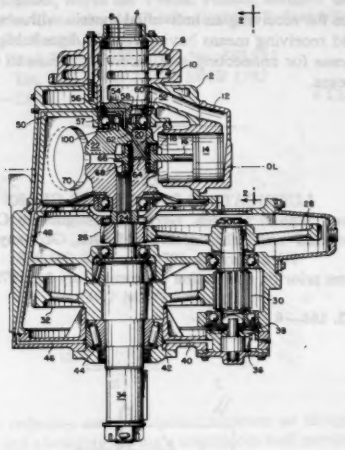
1. In an air motor having a rotary valve substantially coaxial with and adjacent to a crankshaft and including means drivingly interconnecting the two elements, a lubrication system to force-lubricate both elements, comprising:

a. a pump means to provide a continuous supply of lubricant under pressure,

b. conduit means to carry lubricant from the pump to a conduit along the axis of rotation interior of the rotary valve, and

c. means continuously conducting the lubricant from the rotary valve to the hollow interior conduit of the crank-

shaft during operation of the motor wherein the means for conducting the lubricant includes a hollow flexible mem-



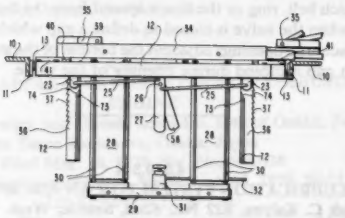
ber compressed between the two elements to form one continuous conduit between the conduits of the elements.

4,050,545

VEHICLE LIFTING JACK ASSEMBLY

Lee Hunter, 13501 Ladue Road, Ladue, Mo. 63141

Filed May 10, 1976, Ser. No. 684,495
Int. Cl.[2] B66F 7/00
U.S. Cl. 187—8.43 6 Claims



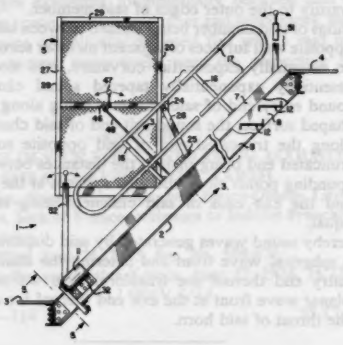
1. In a vehicle lifting jack assembly, lift rack runways to carry a vehicle, lifting jack means carried by said runways in position for movement between folded non-lift and operative lift positions to engage a vehicle, power operated means connected to said lifting jack means to effect vehicle lifting movement, safety means responsive to movement of said lifting jack means in lifting a vehicle to prevent accidental reverse movement of said lifting jack means, said safety means including cooperating ratchet and pawl means operable in response to lifting of a vehicle to prevent the accidental reverse movement and means to disable movement of said lift jack means toward folded position, said ratchet means and said pawl means being carried by said lifting jack means, and means carried by said power operated means and connected to said pawl means to disable the latter for lowering the vehicle.

4,050,546

ELEVATOR STRUCTURE

Woodrow Wilson, Jr., Brownsville, Tex., assignor to Deepwater Salvage, Inc., Brownsville, Tex.

Filed Aug. 19, 1976, Ser. No. 716,063
Int. Cl.[2] B66B 9/08
U.S. Cl. 187—12 5 Claims



5. An elevator structure for use on an inclined stairway extending between a lower landing and an upper landing, said elevator structure comprising:

a. an elevator car;

b. a pair of laterally spaced rail member extending between a lower landing and an upper landing;

c. means mounted on said elevator car and movable along said rail members for guiding said elevator car between the lower landing and the upper landing;

d. drive means mounted on said rail members and operatively connected to said elevator car for selectively moving said elevator car along said rail members, said drive means including a pair of ball screws;

e. control means mounted on said elevator car and on one of said rail members and operatively connected to said drive means for selectively activating same;

f. said rail members are each C-shaped members and include a pair of opposed guide flanges;

g. said means for guiding said elevator car between the lower landing and the upper landing includes:

1. a pair of side members mounted on said elevator car and each positioned adjacent a respective one of said rail members, said side members each being connected to said drive means;

2. a first and second plurality of longitudinally spaced rollers each mounted on a respective one of said side members, each of said rollers being in engagement with said opposed guide flanges of a respective one of said rail member;

h. said elevator car has opposite sides with including a leading portion and a trailing portion;

i. said elevator car and said side members include cooperating means for pivotally mounting one end of each of said side members on the leading portion of a respective one of the opposite sides of said elevator car; and

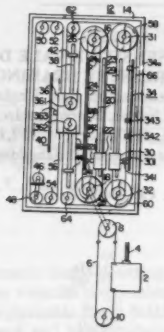
j. each of the opposite sides of said elevator car and said side members include cooperating means for connecting said elevator car to the other end of each of said side members whereby said elevator car is supported on said side members.

4,050,547

FLOOR CONTROLLER FOR AN ELEVATOR

Hiroyuki Katsuka; Seinosuke Yahiro, and Kazuo Suzuki, all of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 3, 1976, Ser. No. 663,252
Claims priority, application Japan, Mar. 5, 1975, 50-26000
Int. Cl.[2] B66B *1/52*
U.S. Cl. 187—29 R 11 Claims



1. A floor controller for an elevator car serving a plurality of floors comprising:

a sychronizer which is movable on a reduced scale in synchronism with the movement of the elevator car;

an advancer which is movable in advance of said synchronizer for detecting a call, said advancer being stopped upon detection of a call;

a difference detector;

a differential system for moving said difference detector in accordance with the relative distance between said sychronizer and said advancer;

first means for controlling the running speed of said elevator car in accordance with the position of said difference detector; and

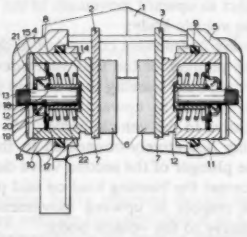
second means for driving said difference detector in a selected direction at the time of generation of a call so that said advancer is moved in advance of said synchronizer.

4,050,548

AUTOMATIC ADJUSTERS FOR HYDRAULICALLY OPERATED DISC BRAKES

Hugh Grenville Margetts, Leamington Spa, England, assignor to Girling Limited, Birmingham, England

Filed Aug. 6, 1976, Ser. No. 712,047
Claims priority, application United Kingdom, Aug. 9, 1975, 33308/75
Int. Cl.[2] F16D *65/50*
U.S. Cl. 188—71.8 16 Claims



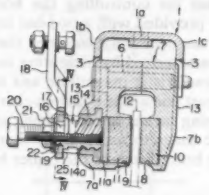
1. An hydraulically-operated disc brake for a vehicle comprising a rotatable disc, friction pad assemblies for engagment with opposite sides of said disc, an hydraulic cylinder on one side of said disc, a piston working in said cylinder to apply one of said pad assemblies to said disc, stop means incorporated in said piston for determing a retracted position of said piston, said stop means comprising a plate provided with an aperture, a pin fixed to said cylinder and projecting through said aperture in said plate, said pin having a section complementary to that of said aperture, an abutment member providing a first abutment for said plate, said abutment member being slidable relative to said piston, first spring means acting on said plate so as to urge said plate towards said pad and so as to urge said plate into a locked tilting position inclined with respect to said pin, and second spring means acting on said abutment member so as to urge it in a direction away from said pad a second abutment on said piston being adapted to limit movement of said abutment member.

4,050,549

DISC BRAKE DEVICE FOR MOTORCYCLES AND THE LIKE

Toshio Hori, Nagano, and Tadao Nakagawa, Ueda, both of Japan, assignors to Nisshin Kogyo Kabushiki Kaisha, Ueda, Japan

Filed Apr. 26, 1976, Ser. No. 680,512
Claims priority, application Japan, Jan. 6, 1976, 51-371[U]
Int. Cl.[2] F16D *55/08*
U.S. Cl. 188—72.8 1 Claim



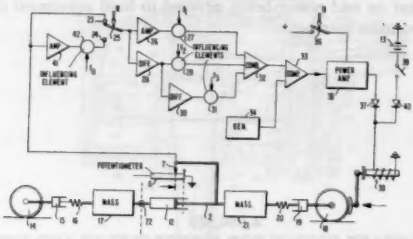
1. A disc brake device for motorcycles and the like, comprising: a fixing bracket of inverted U-shape; a brake caliper slidably carried by said bracket and having a pair of opposite arms disposed in straddling relation to a brake disc of a motorcycle; a friction pad fixed to one of said arms, a movable friction pad slidably inserted into a cylindrical bore formed in the other arm; said disc being interposed between said fixed and said movable friction pads so as to be clamped thereby; a threaded nut member provided in said other arm, a threaded screw member of a relatively large lead for screw engagement with said nut member and having a square shaft formed at the outer end thereof; a brake actuating lever fitted on said shaft, and an adjustment bolt screw-engaged through the center of said screw member and extending therethrough so as to contact at one end thereof the rear face of said movable friction pad; wherein said caliper includes a pair of separate halves that constitute said arms; a pair of sliding rods extend through said caliper halves, to be threadedly engaged by said halves for integral connection thereof; said rods have enlarged head portions and reduced tip-end portions, projecting from opposite side surfaces of said caliper halves so as to be fitted in associated guide holes formed in opposite side portions of said bracket for limited axial movement thereof along with said caliper halves; and wherein a lock nut is threadedly fitted on said bolt for tightly fixing said lever against a flanged portion of said shaft, and also for holding said bolt in a properly adjusted position against rotation thereof relative to said screw member.

4,050,550

PROCESS AND APPARATUS FOR CONTROLLING THE BRAKE FORCE ON THE WHEELS OF TRAILERS

Horst Grossner, Bergien-Lenenberg; Hans Liebold, Adelberg, and Jurgen Wehnert, Stuttgart, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Dec. 12, 1975, Ser. No. 640,141
Claims priority, application Germany, Dec. 20, 1974, 2460450
Int. Cl.² B60T 7/20
U.S. Cl. 188—112 37 Claims



1. A method for controlling the brake force at the wheels of a trailer provided with a tow-bar in the sense of eliminating forces occurring between the towing vehicle and the trailer, comprising the steps of measuring a static characteristic magnitude and separately measuring at least one of the dynamic characteristic magnitudes, and combining said magnitudes at least indirectly to form the control magnitude for the brake force of the trailer brake.

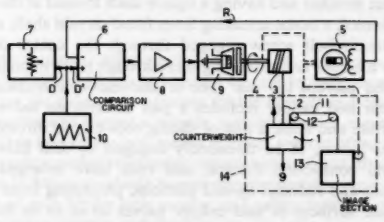
13. An apparatus for controlling the brake force at the wheels of a trailer provided with a two-bar means in the sense of eliminating forces occurring between the towing vehicle and the trailer, characterized by measuring means for measuring the static characteristic magnitude and measuring means for measuring at least one of the dynamic characteristic magnitudes, and combining means for combining at least indirectly said characteristic magnitudes to form thereby the control magnitude for the brake force of the trailer brake.

4,050,551

DEVICE FOR BRAKING A COUNTERWEIGHT IN AN X-RAY EXAMINING APPARATUS

Walter Schmedemann, and Wolfgang Hecker, both of Hamburg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 13, 1975, Ser. No. 604,242
Claims priority, application Germany, Aug. 28, 1974, 2441265
Int. Cl.² B60T 8/02
U.S. Cl. 188—181 C 1 Claim



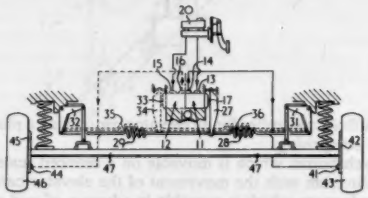
1. X-ray apparatus comprising:
an image section;
a counterweight for compensating for the weight of said image section, said counterweight being uncouplable from said image section when said image section is in an orientation not requiring weight compensation;
a speed detector adapted to generate a signal proportional to the difference in speed between said counterweight and said image section, said counterweight and image section having the same speed when coupled for weight compensation;
a brake for braking the speed of said counterweight; and
a control circuit responsive to said signal for actuating said brake when the amplitude of said signal exceeds a predetermined value.

4,050,552

INDIVIDUAL LOAD-SENSITIVE VALE DEVICES FOR VEHICLE FLUID PRESSURE BRAKING SYSTEMS

Alastair John Young, Leamington Spa, England, assignor to Automotive Products Limited, Warwickshire, England

Filed Jan. 6, 1977, Ser. No. 757,154
Claims priority, application United Kingdom, Jan. 27, 1976, 02977/76
Int. Cl.² B60T 8/22
U.S. Cl. 188—195 8 Claims



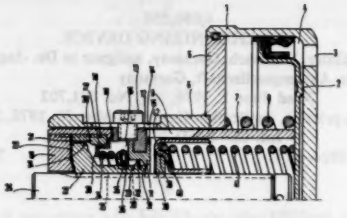
1. A vehicle fluid pressure braking system comprising:
a driver-controlled source of fluid pressure;
a first resiliently suspended wheel on one side of the vehicle;
a second resiliently suspended wheel on the other side of the vehicle;
a first brake acting on said first wheel;
a second brake acting on said second wheel;
a first brake actuator operative to apply said first brake;
a second brake actuator operative to apply said second brake;
first and second valve devices mounted on the vehicle body and interposed between the driver-controlled source and said first and second brake actuators respectively, each of said valve devices including a plunger and a valve such that the plunger is movable by fluid pressure transmitted to the respective brake actuator against a biassing load to close said valve and prevent the fluid pressure in the respective brake actuator increasing at the same rate as the driver-controlled source when the fluid pressure transmitted to the respective brake actuator exceeds a value which is dependent on said biassing load;
a first spring operatively connected to the first wheel and to the plunger of the first valve device to progressively increase the biassing load on said plunger at a high rate with respect to upward movement of the first wheel relative to the vehicle body;
a second spring operatively connected to the second wheel and to the plunger of the first valve device to progressively decrease the biassing load on said plunger at a low rate with respect to upward movement of the second wheel relative to the vehicle body;
a third spring operatively connected to the second wheel and to the plunger of the second valve device to progressively increase the biassing load on said plunger at a high rate with respect to upward movement of the second wheel relative to the vehicle body;
and a fourth spring operatively connected to the first wheel and to the plunger of the second valve device to progressively decrease the biassing load on said plunger at a low rate with respect to upward movement of the first wheel relative to the vehicle body.

4,050,553

AUTOMATIC BRAKE RESETTING DEVICE

Hans Pollinger, and Bernd Scheffel, both of Munich, Germany, assignors to Knorr-Bremse GmbH, Munich, Germany

Filed July 23, 1976, Ser. No. 708,022
Claims priority, application Germany, Dec. 5, 1975, 2554806
Int. Cl.[2] F16D 65/66
U.S. Cl. 188—203 7 Claims



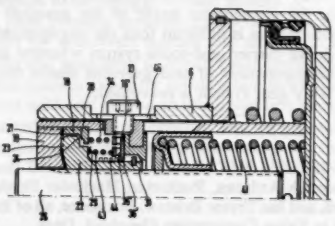
1. In an automatic brake resetting device particularly for brakes of railway vehicles the combination of a non-rotatable sleeve axially displaceable in the braking direction in response to a braking force and having abutment means thereon, an axially displaceable non-rotatable threaded shaft co-axially disposed within said sleeve, a coupling nut threaded upon said shaft and capable of rotary and axial movement thereon, means on said sleeve for defining a first rotary coupling with one side of said coupling nut and a second rotary coupling with the other side of said coupling nut, said rotary couplings being actuable by axial displacement of said coupling nut, a stop ring traversing said coupling nut and axially displaceable thereon, a fixed first stop to support said stop ring opposite to the braking direction, a second stop on said coupling nut spaced in the direction opposite to said braking direction relative to said first stop a distance approximately equal to the contact stroke of the vehicle brake when the brake resetting device is in the inoperative position, and spring means between said abutment means and said stop ring to act continuously upon said sleeve in the braking direction and to act on said stop ring opposite to the braking direction.

4,050,554

AUTOMATIC BRAKE RESETTING DEVICE

Bernd Scheffel, Munich, Germany, assignor to Knorr-Bremse GmbH, Munich, Germany

Filed July 23, 1976, Ser. No. 708,047
Claims priority, application Germany, Dec. 5, 1975, 2554816
Int. Cl.[2] F16D 65/66
U.S. Cl. 188—203 5 Claims



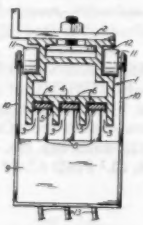
1. In an automatic brake resetting device particularly for brakes of railway vehicles the combination of a non-rotatable sleeve axially displaceable in the braking direction in response to a braking force, an axially displaceable non-rotatable threaded shaft co-axially disposed within said sleeve, a coupling nut threaded upon said shaft and capable of rotary and axial movement thereon, means on said sleeve for defining a first rotary coupling with one side of said coupling nut and a second rotary coupling with the other side of said coupling nut, said rotary couplings being actuable by axial displacement of said coupling nut, a stop ring traversing said coupling nut and axially displaceable thereon, a fixed first stop to support said stop ring opposite to the braking direction, abutment means on said sleeve, a second stop on said coupling nut spaced rearwardly of said first stop a distance approximately equal to the contact stroke of the vehicle brake, first spring means acting upon said stop ring opposite to the braking direction of said sleeve and acting upon said abutment means and said sleeve in the braking direction, and second spring means between said stop ring and said coupling nut mounted for rotation in at least one direction and acting upon said coupling nut in the braking direction.

4,050,555

TROLLEY RAIL ASSEMBLY

Donald R. Ross, Jr., Pittsburgh, Pa., assignor to U-S Safety Trolley Corporation, Pittsburgh, Pa.

Filed May 25, 1976, Ser. No. 689,782
Int. Cl.[2] B60M 1/34
U.S. Cl. 191—23 A 3 Claims



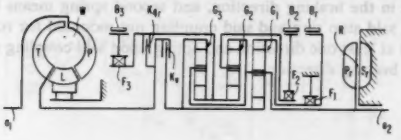
1. A trolley rail assembly comprising extruded plastic housing means of indefinite length for supporting an electrical conductor bar, the housing means having a back formed for fastening to a support, said housing means having a front side provided with a slot extending lengthwise thereof for receiving an electric current pick-up member movable lengthwise of the housing means, a pair of retaining ribs integral with the side walls of the slot and extending lengthwise thereof and projecting from those walls toward each other, a single continuous electric conductor bar disposed in said slot in operative position behind said ribs, the width of the bar being greater than the space between the ribs and less than the space between said side walls in front of the ribs, and said housing means being so formed that in assembling the housing means and the bar the distance between said ribs can be increased temporarily by pressure of the bar against them to permit the bar to be moved rearwardly past the ribs into said operative position, whereby the bar can be inserted from the front side of the slot, the ribs being the sole means for supporting the bar in said operative position, and flexible guard strips integral with the outer ends of the side walls of said slot and extending lengthwise thereof, said strips converging forward and being of less hardness than said housing means, said housing means and guard strips and conductor bar being flexible enough to be coiled before installation.

4,050,556

AUTOMATIC TRANSMISSION WITH RETARDER

Hans-Joachim M. Förster, Stuttgart-Riedenberg, and Ulrich Eltze, Esslingen-Liebersbronn, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Continuation of Ser. No. 305,279, Nov. 10, 1972, abandoned.
This application Mar. 13, 1975, Ser. No. 558,163
Claims priority, application Germany, Nov. 11, 1971, 2156002
Int. Cl.[2] B60K *41/26*
U.S. Cl. 192—4 B 86 Claims



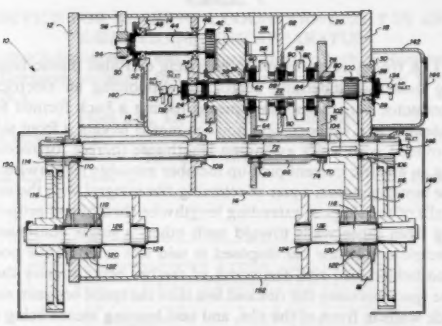
1. A transmission arrangement for vehicles having a driving engine, the arrangement characterized in that a transmission is provided, the transmission includes an input means output means, and shifting means for selectively engaging the speeds of the transmission including free-wheeling means, in that a retarder means is provided and serves as an additional brake, the retarder means being disposed on the output side of the transmission, in that control means are provided for controlling the braking moment of the retarder means in dependence upon the magnitude of the rotational speed at the free-wheeling means of the engaged speed, and in that the free-wheeling means remain operable constantly with actuation of the retarder means.

4,050,557

TWO-SPEED TRANSMISSION HAVING ENCLOSED FLYWHEEL

Jene A. Beneke, Parker, Tex., and George J. Bozich, Chicago, Ill., assignors to Verson Allsteel Press Company, Dallas, Tex.

Filed July 23, 1975, Ser. No. 598,350
Int. Cl.[2] F16D *67/04*
U.S. Cl. 192—4 R 18 Claims



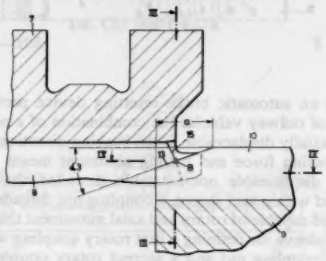
1. A transmission system for a press machine comprising:
an oil housing to provide lubrication therein,
a shaft rotatably mounted within said oil housing,
a flywheel rotatably mounted within said oil housing,
a motor located outside said housing,
a drive shaft rotatably extending through the wall of said housing,
oil seal means for preventing the passage of oil between said drive shaft and said housing wall,
means connected between said motor and said drive shaft for rotating said drive shaft,
a gear formed on the end of said drive shaft for causing rotation of said flywheel,
high speed and low speed clutches mounted adjacent said shaft within said housing, and
means for selectively operating said clutches to transmit rotative motion from said flywheel to said shaft through either of said clutches.

4,050,558

SYNCHRONIZING DEVICE

Robert Müller, Weissach, Germany, assignor to Dr. -Ing. H.c.F. Porsche Aktiengesellschaft, Germany

Filed June 1, 1976, Ser. No. 691,702
Claims priority, application Germany, May 30, 1975, 2523953
Int. Cl.[2] F16D *11/04, 23/08*
U.S. Cl. 192—53 G 7 Claims



1. Synchronizing device for change-speed gears comprising:
a gearshift sleeve carrier mounted for rotation with a shaft, said sleeve carrier having a sleeve carrier gear-tooth system;
a clutch body part of a gear to be shifted, said clutch body part including a clutch body gear-tooth system; and
a gearshift sleeve having a gearshift sleeve gear-tooth system drivingly connected with said sleeve carrier gear-tooth system and selectively drivingly engageable with said clutch body gear-tooth system upon axial movement of said gearshift sleeve, said gearshift sleeve gear-tooth system and said sleeve carrier gear-tooth system being engageable with one another at engagement surfaces which are in contact with one another when said gearshift sleeve is in a position drivingly engageable with said clutch body gear system;
wherein said engagement surfaces are geometrically configured to bias said gearshift sleeve in a direction corresponding to engagement to bias said gearshift sleeve in a direction corresponding to engagement thereof with said clutch body gear system, wherein, at the engagement surfaces, the engagement angle of the gearshift sleeve gear-tooth system is different than the engagement angle of the sleeve carrier gear-tooth system whereby unintentional disengagement of said gearshift sleeve from said clutch body gear system is prevented.

4,050,559

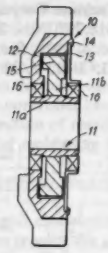
VISCOUS SHEAR FLUID COUPLING

Jeffery Frederick Andrews, Rochester; Harjinder Singh Chauhan, Ilford, and Ian Trevor Bristow, Rochester, all of England, assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 2, 1975, Ser. No. 619,122
Int. Cl.[2] F16D *31/00*
U.S. Cl. 192—58 B 1 Claim

1. A viscous shear fluid coupling comprising a rotary housing, a rotary member mounted within the rotary housing for rotation relative to the rotary housing, the member having a surface thereof close to but spaced from an internal surface of the housing, and a viscous fluid occupying the space between said surfaces in operation of the coupling, said rotary member

comprising an element which is generally of disc form and which is made from aluminum, and a shaft on which the aluminum disc element is secured, the housing comprising an aluminum part providing a recess for the disc element, a closure plate secured axially against the aluminum part to close off the recess, and a roller thrust bearing disposed between the closure plate and the facing surface of the aluminum disc element.

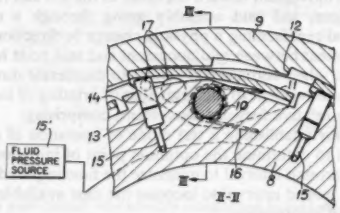


4,050,560

FLUID PRESSURE ACTUATED CLUTCH FOR STARTING MULTI-STAGE TURBINE

N. A. Ragnar Torstenfelt, Finspong, Sweden, assignor to Stal-Laval Turbin AB, Finspong, Sweden

Filed Feb. 17, 1976, Ser. No. 658,653
Claims priority, application Sweden, Feb. 19, 1975, 7501831
Int. Cl.² F16D *25/00*
U.S. Cl. 192—85 AT **4 Claims**



1. A clutch apparatus for selectively connecting first and second concentric shafts in a multi-stage turbine, comprising:
- a plurality of pawls pivotally mounted on said first shaft;
- a plurality of gear teeth mounted on said second shaft in position to be engaged by said pawls;
- first fluid pressure actuated means connected to said first shaft for selectively forcing said pawls into engagement with said gear teeth to connect said shafts; and
- second resilient means for pivoting said pawls out of engagement with said gear teeth when said first means is depressurized and friction between said pawls and said teeth dissipates as said second shaft rotates faster than said first shaft.

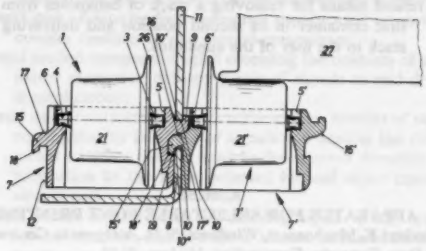
4,050,561

CONVEYOR FOR STACKING CASES IN A RUN-THROUGH STORAGE STRUCTURE

Peter Seitz, Bosgrunder Weg 64, 6550 Bad Kreuznach, Germany

Filed July 14, 1976, Ser. No. 705,028
Claims priority, application Germany, July 24, 1975, 2533113
Int. Cl.² B65G *13/00*
U.S. Cl. 193—35 R **7 Claims**

1. A conveyor for stacking cases in a storage structure or the like comprising:
- a frame having spaced elongated members with a plurality of openings thereof,
- a plurality of bearing cages, said bearing cages having at least one shaped projection extending to one side,
- a plurality of locking members each having a complementary shaped projection, said projections on said bearing cages and complementary projections on said locking members arranged to interengage through said openings in said frame members to secure the bearing cages to said members,
- a plurality of rollers having an axle therethrough extending to each side thereof, said axles being insertable in the journal bearings of said bearing cages.

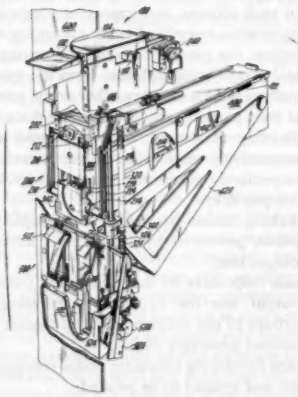


4,050,562

BANKNOTE ESCROW AND STACKER APPARATUS AND METHOD

Guustaaf Arthur Schwippert, Pijnacker, and Wilhelm Aart Van Zeggeren, Bleiswijk, both of Netherlands, assignors to Mars, Inc., McLean, Va.

Continuation-in-part of Ser. No. 569,155, April 18, 1975. This application Mar. 11, 1976, Ser. No. 665,914
Claims priority, application United Kingdom, Apr. 22, 1974, 17551/74
Int. Cl.² G07F *1/06*
U.S. Cl. 194—4 E **45 Claims**



1. A banknote handling apparatus having a first container which is movable within the apparatus between a first position and a second position, the container having at least one opening through which banknotes can be moved,
- a second container having an opening for receiving banknotes from the first container,
- means for transporting received banknotes to a predetermined position adjacent the first position of the first container,

means for transporting banknotes from the predetermined position into the first container for stacking of the banknotes in facial contact therein,

means for transporting a stack of banknotes from within the first container into the second container,

means for moving the first container between its first position and its second position, and

refund means for removing a stack of banknotes from the first container in its second position and delivering the stack to the user of the apparatus.

4,050,563

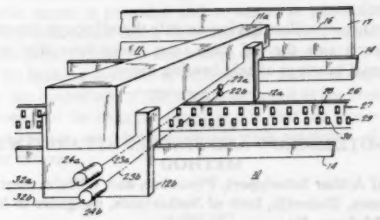
APPARATUS FOR SELECTABLE FONT PRINTING

Herbert E. Menhennett, Windham, N.H., assignor to Centronics Data Computer Corporation, Hudson, N.H.

Filed Nov. 5, 1975, Ser. No. 629,020

Int. Cl.² B41J *3/04*

U.S. Cl. 197—1 R **16 Claims**



1. Apparatus for printing a line of characters on a paper document in a selected one of a plurality of character sizes for use in a dot-matrix printer having a print head assembly movable across the paper document and having a plurality M of print wire driving means, each of said characters formed within a predetermined dot matrix of N dot columns having M dots in each column, said apparatus comprising:

a registration assembly having a plurality of arrays of spaced indicia, the spacing between and among indicia in each of said arrays being different from the spacing between and amomg indicia in every other array, said arrays extending at least partially across the paper document;

a plurality of means mounted on said head assembly for respectively sensing the indicia in each of said arrays for respectively generating registration pulses;

an output line;

switching means for selectively coupling the registration pulses generated by one of said sensing means to said output line;

means responsive to the registration pulses coupled to said output line for cyclically generating a succession of groups of dot column selection signals;

character generator means;

means for storing character codes representing each character and symbol to be printed;

means responsive to each completed group of said dot column selection signals for applying the next character code to said character generator means;

said character generator means generating print signals representing a dot column pattern determined by the character code in said storing means and by the dot column selection signal coupled thereto;

said print wire driving means being adapted to receive said print signals for printing the dot column pattern outputted by said character generator means.

4,050,564

ELECTRONIC CONTROL FOR OPTIMIZING CARRIER TURNAROUND IN PRINTING APPARATUS

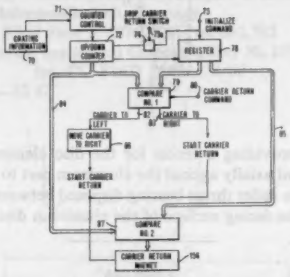
John Michael Carmichael, Nicholasville; James David Hill, and Donald Lee West, both of Lexington, all of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 418,797, Nov. 23, 1973, abandoned.

This application Dec. 4, 1975, Ser. No. 637,706

Int. Cl.² B41J *1/00*

U.S. Cl. 197—1 R **10 Claims**



1. Printing apparatus for printing information on a document during relative movement of said document and a print head assembly, wherein said relative movement involves movement of said assembly between left and right margin locations, printing of information occurring during a relative forward movement toward one of the left and right margin locations with printing of information beginning at the other of the left and right margin locations, and non-printing occurring during a relative return movement toward the other of the left and right margin locations, and said assembly going through a turn around interval representing a physical change in direction of relative movement between said document and said print head assembly from when said assembly starts to decelerate during relative return movement to the beginning of printing of information during relative forward movement, comprising:

test means for establishing a test mode of operation of said apparatus to determine the optimum point of initiation of said turn around interval to minimize the time required for said turn around interval to increase the time available for printing of information;

said test means includes storage means for storing data representative of said optimum point;

and means to initiate said turn around interval during printing operations in accordance with the data in said storage means.

4,050,565

KEYBOARD CONTROLLED ELECTRONIC EMBOSSING MACHINE

Michael Helder, Stutensee, and Rainer Eberhard Gürgens, Berlin, both of Germany, assignors to Adrema Pitney Bowes, Berlin, Germany

Filed Apr. 23, 1976, Ser. No. 679,736

Claims priority, application Germany, Apr. 25, 1975, 2518590

Int. Cl.² B41J *1/22, 3/38*

U.S. Cl. 197—6.3 **4 Claims**

1. In an electronic embossing machine of the type having a keyboard which determines the character to be embossed, a memory electronically connected to the keyboard to receive information therefrom and store such information, a logic controller connected to the memory for receiving information and to inform the logic controller as to the character selected by the keyboard, a drum rotatably supported upon a rotatable shaft which has a plurality of numerically arranged code addresses about its perimeter, a scanner adjacent to the drum for reading the code addresses, the scanner being electrically connected to the logic controller for supplying information to

the logic controller as to the code address being read, a die head rotatably mounted on the shaft and bearing a plurality of dies thereon which have characters corresponding to the code addresses on the drum, brake means electrically connected to the logic controller and operative to brake the shaft upon receipt of a signal from the logic controller, and drive means operatively controlled by the logic controller and connected to the shaft for rotation thereof in either direction upon receipt of a signal from the logic controller to rotatably displace a keyboard selected die to the embossing position, the improvement residing in the logic controller having control means for selecting the shortest direction of rotation of the die head to locate a selected die in the embossing position, the control means comprising:

an intermediate memory electrically connected to the code drum;

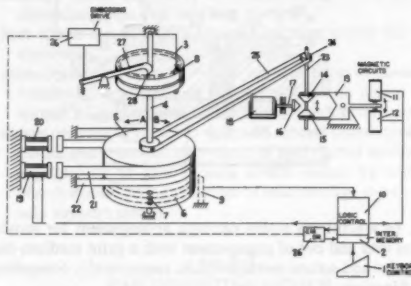
a die position counter electrically connected to said intermediate memory to receive the code address of the die in the embossing position;

a first comparator electrically connected to said die position counter and to the memory associated with the keyboard to receive and compare a code address signal and a character select signal respectively;

an impulsing means electrically connected to the keyboard and said first comparator;

a control logic unit electrically connected to said impulsing means and said die position counter;

a step counter electrically connected to said impulse means, said control logic unit and said die position counter;



a gate circuit electrically connected to said step counter, said control logic and said die position counter;

a pair of intermediate memories, each being electrically connected to said gate circuit,

a second comparator electrically connected to said intermediate memories; and

a drive control circuit electrically connected to the intermediate memories and the drive means, whereby, upon selection of a character of the keyboard control,

said die position counter receives, through said intermediate memory, the code address corresponding to the die located in the embossing position and supplies such code address to said first comparator;

said impulsing means is enabled to deliver timing impulses to said die position counter and said step counter, each of which commence counting such impulses;

said first comparator compares the code address of the character selected through the keyboard control with the code address received from said die position counter until coincidence is obtained wherein said impulsing means is disabled;

said step counter counts the number of steps made by said impulsing means to reach said coincidence and supplies said number to a first of said pairs of intermediate memories through said gate circuit;

said control logic unit sets said step counter to zero and again triggers said impulsing means to count in the reverse direction of the first count;

said control logic unit enables the die position counter to count in the reverse direction timing impulses received from said impulsing means until said first comparator evaluates coincidence between the signal received from the keyboard control and said die position counter whereupon said impulsing means is disabled;

said step counter counts the steps of said die position counter in the reverse direction and supplies a corresponding signal to the second of said paired intermediate memories;

said pair of intermediate memories supply such respective counter readings to said second comparator;

said second comparator upon receiving the contents of said paired memories, delivers a pair of signals to said drive control circuit;

said drive control circuit selects the smaller number of steps represented by said pair of signals and enables the drive means to drive the die head in the selected direction in proportion to the signal selected by said drive control circuit; and

said motor control sends an enabling signal to the brake means when the selected die is located in the embossing position to terminate rotation of the die head.

4,050,566

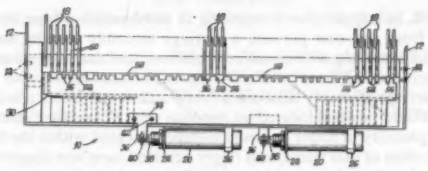
MECHANICAL CODE CONVERTER FOR USE WITH A TYPEWRITER OR THE LIKE

William E. Webb, Hoffman Estates, and Stephan J. Ehas, Chicago, both of Ill., assignors to Hamilton Communications, Inc., Schaumburg, Ill.

Filed Nov. 18, 1975, Ser. No. 632,930

Int. Cl.[2] B41J *5/30*

U.S. Cl. 197—19 **12 Claims**



1. Apparatus for use with a typewriter or the like and adapted to decode unique combinations of electrical signals, the combinations identifying individual characters associated with a trip member of a particular typewriter hammer, said apparatus being adapted to actuate a particular trip member in response to receiving a combination of electrical signals identifying the same, the apparatus comprising:

a mechanism associated with each trip member and adapted to actuate the same in response to movement from a rest to an actuated position;

a plurality of aligned coded flat plates, said plates being in generally parallel planes, each of said plates having slots located along one edge of the length thereof, each said slot being in one of two positions relative to each trip member, said positions being separated from one another by a predetermined distance, said actuating mechanism for each trip member being adapted to move to said actuated position when the coded plates are selectively positioned in either a first or second position so that all of the slots in the coded plates associated with said particular trip member are in alignment, the nonalignment of any one of said associated slots being effective to preclude movement of said actuating mechanism;

at least two spaced mounting blocks to which support plates for each of said coded plates are rigidly mounted generally perpendicular to said coded plates, said support plates being fabricated of flexible material that permits generally lengthwise movement of said coded plates and also biases said coded plates in one of said first and second positions;

means associated with each of said plurality of coded plates for moving each of said plates between said first and

second positions to bring the slots into and out of alignment with the actuating mechanism in response to said electrical signals, a predetermined combination of electrical signals causing said moving means to selectively move said coded plates and align the slots so that a predetermined one of said actuating mechanisms moves to said actuating positions and causes the associated trip hammer to be actuated; and,

means for resetting said actuating mechanism subsequent to actuation of said associated trip member.

4,050,567

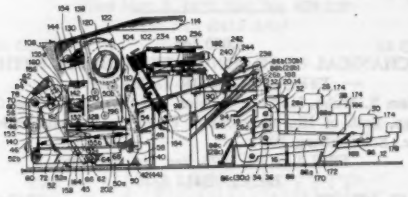
SHIFT MECHANISM FOR TYPEWRITER

Shigeaki Kuramochi, 24-17 5 Chome, Koishikawa Bunkyo, Tokyo, Japan

Continuation-in-part of Ser. No. 476,847, June 6, 1974, Pat. No. 3,934,697. This application Jan. 23, 1976, Ser. No. 651,920

Int. Cl.[2] B41J *11/14*

U.S. Cl. 197—72 **9 Claims**



1. In a typewriter comprising in combination a base having a front and rear portion, a carriage assembly located within and extending across said rear portion, said carriage assembly including a platen which is adapted for movement with said carriage assembly between a first position and either a second or third position located on opposite sides of said first position, a plurality of finger actuated members located within the front portion of said frame, said finger actuated members disposed in a plurality of tiers with each said tier including a plurality of said finger actuated members, means for supporting said finger actuated members of each tier for pivotal movement between a rest and an actuated position about pivot axes disposed substantially parallel to said carriage assembly, a plurality of type bars, a plurality of carriers upon which is disposed typing indicia at locations equal in number to the positions of said carriage assembly, each carrier mounted by one of said type bars, means supporting said type bars for pivotal movement toward said platen, means connecting respective ones of said finger actuated members and type bars so that when one of said finger actuated members is pivoted to said actuated position said type bar connected thereto also is pivoted whereby typing indicia at one of said locations strikes said platen, and wherein the improvement is in means for selective shifting of said carriage assembly from said first position to either said second or third position so that said platen may be struck by typing indicia at other of said locations, said shifting means comprising

a. mounting means, said mounting means carried on and extending upwardly of said frame within the region of said rear portion,

b. first means adapted for shifting said carriage assembly from said first position to said second position, said first means including a first lever,

c. means pivotally supporting said first lever between its ends on said mounting means,

d. second means cooperable with said first means adapted for shifting said carriage assembly from said first position to said third position, said second means including a second lever,

e. means pivotally supporting said second lever between its ends on said mounting means,

f. track means,

g. means mounting said carriage assembly on said track means for movement with and along said track means,

h. means connecting said track means and said first lever adjacent one end,

i. means connecting one of said finger actuated members to said first lever adjacent the other end so that upon movement of said finger actuated member to said actuated position said first lever pivots in one direction to move said carriage assembly to said second position,

j. means connecting another of said finger actuated members to said second lever adjacent one end, and

k. means connecting the other end of said second lever to said first lever so that upon movement of said lastnamed finger actuated member to said actuated position said first lever pivots in a second direction to move said carriage assembly to said third position.

4,050,568

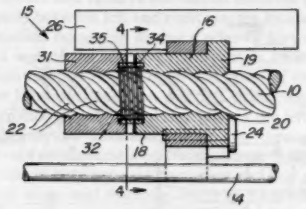
STYLUS CARRIAGE DRIVE

Michael LaVar Davies, American Fork; Richard Servern Johnson; Alvin John Noker, both of Bountiful, and Veldon Lawrence Wilde, Centerville, all of Utah, assignors to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 5, 1975, Ser. No. 637,973

Int. Cl.[2] B41J *19/20*

U.S. Cl. 197—90 **1 Claim**



1. In a printer a stylus carriage arrangement for moving a stylus into and out of engagement with a print medium during the print and return carriage cycle, respectively, comprising in combination;

an externally-threaded lead screw;

support means for supporting the ends of said lead screw for rotational movement therein;

motor means connected to said lead screw for rotating said lead screw in a clockwise direction for the print cycle and in a counterclockwise direction for the carriage return cycle;

a stylus carriage mounted on said lead screw through an opening having internal threads which mesh with the threads of said lead screw;

a nut mounted on said lead screw via an internally-threaded opening; and

a spring disposed on said lead screw between said nut and said stylus carriage creating an axial opposing force between said nut and said stylus carriage;

said stylus carriage and said nut having annular recesses concentric with the respective openings therethrough for receiving said spring enabling said stylus carriage and said nut to be disposed on said lead screw in contiguous relationship with said spring compressed therebetween;

each of said stylus carriage and said nut having semicircular portions extending therefrom forming complementary abutting edges to prevent relative rotational movement of said stylus carriage and said nut and to cause said spring to be substantially entirely contained in said annular recesses when said edges are in contiguous relationship;

a rod held stationary by said support means;

said stylus carriage having a slot formed therein having a width somewhat greater than the diameter of said rod;

said rod disposed within said slot enabling said stylus carriage to rotate on said lead screw only a predetermined distance in either direction; and

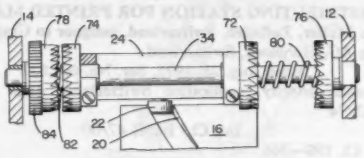
a stylus disposed on said stylus carriage which is moved into a print position and away from a print position when said lead screw is rotated in a first or second direction, respectively, by said motor means.

4,050,569

RECORD MEDIA ADVANCING MECHANISM

Leslie L. Crump, and Victor J. Italiano, both of Trumansburg, N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed June 4, 1976, Ser. No. 693,033
Int. Cl.[2] B41J *19/90*
U.S. Cl. 197—120 **17 Claims**



1. Means for advancing record media past a working station comprising:

support means mounted for rotational movement,

carriage means carried by said support means and movable therealong past said working station,

first clutch means secured to said carriage means for travel therewith,

second clutch means mounted on said support means for rotational movement of said second clutch means in response to engagement by said first clutch means, and

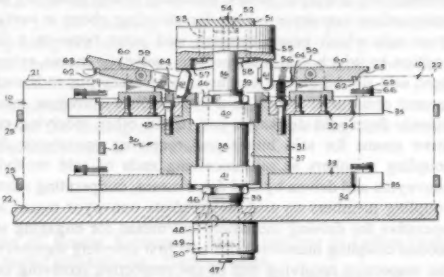
means operably associated with said second clutch means for causing incremental movement of said record media upon engagement of said second clutch means by said first clutch means during traversal of said carriage means along said support means.

4,050,570

CAN ORIENTING DEVICE

Norman C. Kramer, North Hollywood, Calif., assignor to Carnation Company, Los Angeles, Calif.

Filed June 4, 1976, Ser. No. 692,855
Int. Cl.[2] B65G *47/84*
U.S. Cl. 198—398 **7 Claims**



1. A can orienting device for use with cylindrical cans having a seamed top end and a rounded bottom edge which comprises

a rotatable wheel having a plurality of can receiving pockets around its periphery, said wheel being adapted to receive cans from an inlet chute and rotatably carry said cans to one of a pair of outlet chutes laterally spaced about the axis of rotation of said wheel, the wheel being disposed substantially parallel to the base of said chutes

lever means carried on said rotatable wheel and mounted for pivotal movement above each of said pockets,

said lever means having a can contacting end portion which is adapted to be pivotally moved toward the can receiving pocket to engage the seamed top end of the cans and hold in the pockets those cans which are positioned on the inlet chute with the seamed top end adjacent the lever means, and to urge out of the pockets those cans which are positioned on the inlet chute with the rounded bottom edge adjacent the lever means, and

means operatively connected to said lever means to maintain the can contacting end portion of the lever means in a can engaging position substantially parallel to said wheel when the lever means is rotatably carried on said wheel from the inlet chute to the outlet chute most remote from the inlet chute around the axis of rotation of the wheel and to pivotally move the lever means out of a can engaging position when the lever means is rotatably carried from said outlet chute to said inlet chute

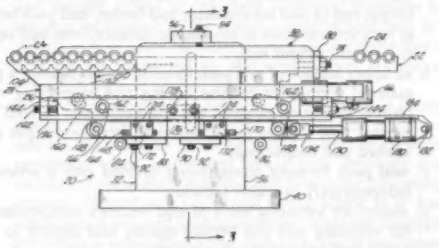
whereby cans received in the pockets of said wheel with the rounded bottom edge of the can adjacent the lever means are urged out of the pocket and are carried by the wheel to a first outlet chute, while cans received in the pockets of said wheel with the seamed top end of the can adjacent the lever means are held in the pocket by the lever means and carried to a second outlet chute more remote from the inlet chute around the axis of rotation of the wheel.

4,050,571

WALKING BEAM TRANSFER MECHANISM WITH SINGLE ACTUATOR MEANS TO CAUSE BOTH LIFTING AND CARRYING

Anthony Kushigian, 720 E. Baseline Road, Northville, Mich. 48167

Continuation of Ser. No. 485,793, July 5, 1974, abandoned. This application May 10, 1976, Ser. No. 685,126
Int. Cl.[2] B65G *25/02*
U.S. Cl. 198—774 **6 Claims**



1. A transfer mechanism comprising a bed, a slide carried by said bed for horizontally reciprocal movement relative to said bed along a first path between spaced-apart extended and retracted positions of said slide, a plurality of part supports equally spaced apart generally in one direction along said first path, a unitary walking beam having a plurality of part cradles equally spaced apart generally in one direction along said first path, said part cradles being integrally interengaged for comovement with each other, said walking beam being carried by said first slide for movement therewith along said path and for movement generally transverse to said path, a pair of bell cranks spaced from each other in said one direction, each of said bell cranks having a pair of rigidly integral lever arms joined at an apex and being pivotally fastened at its apex on said slide such that said bell cranks move horizontally in unison with said slide, one of said arms of each bell crank being pivotally fastened to said walking beam such that pivotal movement of said bell cranks on said slide moves said walking beam vertically relative to said slide, horizontally reciprocating actuating linkage comprising an actuating bar, each of said bell

cranks being pivotally fastened to said linkage with at least one of said bell cranks being pivotally fastened to said actuating bar such that initial movement of said actuating bar in one direction pivots both bell cranks in unison to move said walking beam vertically, abutment means for interengaging said actuating bar and said slide at the completion of said initial movement of said bar so that continued movement of said bar in said one direction causes said slide, said bell cranks and said walking beam to move in unison in said one direction.

4,050,572

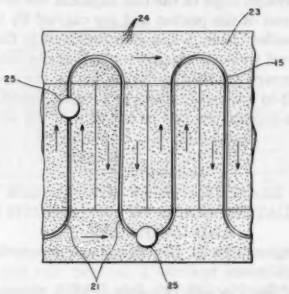
ACCUMULATOR AND FEEDER

Jack W. Armstrong, Baldwinsville, N.Y., assignor to Lipe-Rollway Corporation, Syracuse, N.Y.

Continuation-in-part of Ser. No. 460,606, April 12, 1974, abandoned. This application Aug. 4, 1975, Ser. No. 601,298

Int. Cl.[2] B65G *43/08*

U.S. Cl. 198—347 **19 Claims**



1. An object accumulator and feeder having an input end and an output end and comprising:

a. means for forming a relatively long path for said objects to move in succession in a row from said input end to said output end of said accumulator and feeder, said path being at least several times as long as the distance from said input end to said output end;

b. an upper surface of said path forming means bearing a pile material formed of bristles having tips supporting said objects and being inclined toward a direction of feed for moving said objects along said path from said input end toward said output end;

c. said path forming means being divided into a series of independently operable sections;

d. means for vibrating each of said sections independently for vibrating said pile bristles against said objects to advance said objects along said path;

e. a sensor arranged at a sensing region along said path in each of said sections, said sensor having an output distinguishably responsive to the presence or absence of one of said objects in said sensing region;

f. timing means arranged for receiving and respnding to said output from each respective one of said sensors;

g. said timing means being in circuit with said vibrating means;

h. said timing means being arranged for switching off a predetermined one of said vibrating means at the end of a predetermined interval of said output of a preassociated one of said sensors remaining responsive to the presence of one of said objects in said sensing region;

i. said timing means being arranged for switching on a predetermined one of said vibrating means at the end of a predetermined interval after said output of a preassociated one of said sensors changes from responsiveness to the presence of one of said objects in said sensing region to responsiveness to absence of one of said objects from said sensing region; and

j. said switching of said vibrating means on and off by said timing means being arranged to accumulate said objects by successively filling up said sections with said objects lined up in said row along said path from said output end toward said input end, to feed said objects along said path toward said output end on demand, and to shut off selected ones of said vibrating means to reduce the feeding force on said objects for intervals during which said sections driven by said selected ones of said vibrating means are filled with said objects.

4,050,573

DISTRIBUTING STATION FOR PRINTED MATTER

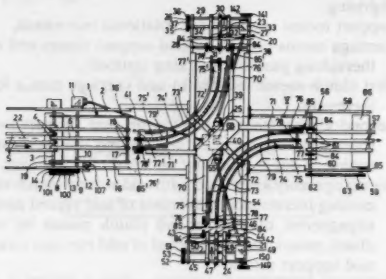
Hans Müller, Zofingen, Switzerland, assignor to Grapha-Holding AG, Hergiswil, Switzerland

Filed Aug. 25, 1975, Ser. No. 607,837

Claims priority, application Switzerland, Aug. 27, 1974, 11642/74

Int. Cl.[2] B65G *47/00*

U.S. Cl. 198—366 **10 Claims**



1. A station for distributing articles, particularly printed matter, comprising an intake conveyor having a first longitudinal axis and a discharge end; two receiving conveyors arranged symmetrically at opposite sides of said longitudinal axis and having respective receiving ends, said receiving conveyors having second longitudinal axes which intersect said first axis at a point longitudinally spaced from all of said conveyors; intermediate conveyor means; mounting means mounting said intermediate conveyor means for pivoting about a vertical pivot axis which passes through said point between a first position in which said intermediate conveyor means extends from said discharge end to one of said receiving ends and a second position in which said intermediate conveyor means extends from said discharge end to the other receiving end; drive means for said intake and receiving conveyors; first coupling members at said receiving ends of said receiving conveyors and driven by said drive means; cooperating second coupling members on said intermediate conveyor means and operative for driving the latter; and means for engaging said second coupling members with said first coupling members of the respective receiving end of the respective receiving conveyor to which said intermediate conveyor means extends for driving the latter proportionately to said respective receiving conveyor to obtain a continuous advancement of the articles from said intake conveyor to said respective receiving conveyor in each of said first and second positions of said intermediate conveyor means, and for disengaging said first and second coupling members from one another to free said intermediate conveyor means for pivoting between said first and second positions.

4,050,574

DEVICE FOR TRANSFERRING PRODUCTS BETWEEN MOULDS OF A PRODUCTION MACHINE AND A TABLE OF A WRAPPING MACHINE

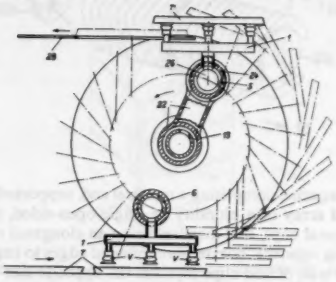
Alexis Chenevard, Morges, and Jean Torres, Lausanne, both of Switzerland, assignors to SAPAL Societe Anonyme des Plieuses Automatiques, France

Filed June 15, 1976, Ser. No. 696,287

Claims priority, application Switzerland, July 30, 1975, 9954/75

Int. Cl.[2] B65G 47/08

U.S. Cl. 198—458 3 Claims



1. Apparatus for removing tablets of chocolate from their respective molds as they issue from a production machine moving horizontally in mutually spaced relationship and transferring them to horizontal conveyor in a plane different from the plane of said path comprising a hollow shaft, cup supports, tubular arms mounting said cup supports for rotation about said shaft on opposite radii thereof in a path successively intersecting the moving tablets issuing from the production machine and said conveyor, means for driving said arms in synchronism with the spacing of said tablets issuing from said machine, means responsive to the angular position of said cups to provide vacuum to them from their intersection with said tablets issuing from said machine until intersection with said conveyor so as to suck up said tablets from said molds to hold them during angular transfer and to free them as they are supported by said conveyor, first cam means driven with said arms to impart to the cup supports an angular correction with respect to the radius of said shaft, in order to keep the longitudinal axis of the suction cups in a vertical position from the beginning of said suction zone until a locus beyond said suction zone, and furthermore in order to turn said axis around an angle of 180° and keep the axis in a vertical position from the beginning of a zone where the tablets or bars are given over to said conveyor until a locus beyond said last mentioned zone, and second cam means driven with said arms to move said arms parallel to the fixed shaft during their rotation in order to control the spacing of the tablets or bars during their transfer from said molds to said conveyor.

4,050,575

BELT CONVEYOR

John H. Roesio, Kalamazoo, Mich., assignor to LaRos Equipment Company, Inc., Portage, Mich.

Filed Mar. 12, 1976, Ser. No. 666,343

Int. Cl.[2] B65G 23/06

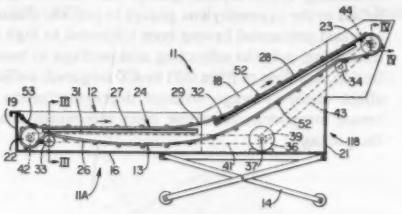
U.S. Cl. 198—834 11 Claims

1. In a belt conveyor having a housing, first and second elongated rollers supported on said housing for rotation about substantially parallel horizontal axes, an endless flat belt supported on and extending between said rollers, said belt being of substantial width and having an outer surface adapted to support articles thereon as they are being moved by said conveyor, and a drive device interconnected to one of said rollers for moving said belt, comprising the improvement wherein:

said second roller is displaced horizontally from and vertically above said first roller;

said belt having a non-straight upper reach which extends between said first and second rollers, said upper reach including first and second elongated and substantially straight belt portions which extend at a substantial angle with respect to one another, said first belt portion being positioned adjacent said first roller and extending outwardly therefrom in a direction which is generally toward said second roller, said second belt portion being positioned adjacent said second roller and extending outwardly therefrom in a direction which is generally toward said first roller, said second belt portion also being inclined at a substantial angle with respect to the horizontal, and a curved belt portion interconnected between said first and second belt portions;

guide means mounted on said housing and disposed for guidably supporting the upper reach of said belt as it extends between said first and second rollers, said guide means engaging the undersurface of said upper reach so



that as it extends between said first and second rollers it is supported solely by the guidable engagement of the undersurface thereof with said guide means;

said drive device causing simultaneous rotation of said first and second rollers in the same rotational direction for causing movement of the upper reach of said belt in a direction from said first roller toward said second roller so that articles supported on said upper reach are moved upwardly by said second belt portion; and

said drive device including a common drive motor, a second power train drivingly connected between said motor and said second roller for causing rotation thereof at a selected peripheral speed, and a first power train drivingly connected between said motor and said first roller for causing rotation thereof at a peripheral speed which is at least equal to said selected peripheral speed, whereby the upper belt reach is substantially free of tension and is maintained in a desired non-straight configuration due to said upper reach being supported solely by said first and second rollers and said guide means so that said upper belt reach does not require the use of any guiding structure disposed in engagement with the upper surface thereof.

4,050,576

POLYMERIC STERILANT ASSEMBLY

Joel L. Williams, Cary; Jerry J. Tulis, Raleigh, and Larry A. Taylor, Hillsborough, all of N.C., assignors to Becton, Dickinson and Company, Rutherford, N.J.

Filed Aug. 17, 1976, Ser. No. 715,162

Int. Cl.[2] B65D 81/24; A61L 3/00, 13/02

U.S. Cl. 206—210 13 Claims

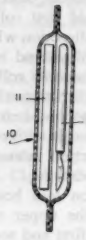
1. An article of manufacture, comprising:

a sterilant package, said sterilant package including in the interior of such package a polyacetal containing oxymethylene groups and stabilizing groups linked to the oxymethylene groups to prevent chain cleavage, said polyacetal having been subjected to high energy irradiation, prior to

subjecting said package to heat sterilization, in a dose of from 0.01 to 400 megarads sufficient to effect chain cleavage without depolymerization to increase formaldehyde release upon subsequent heating of the package.

9. In a process for producing a sterilant package including an article to be sterilized, the improvement comprising:

including in the interior of the sterilant package a polyacetal



containing oxymethylene groups and stabilizing groups linked to the oxymethylene groups to prevent chain cleavage, said polyacetal having been subjected to high energy irradiation, prior to subjecting said package to heat sterilization, in a dose of from 0.01 to 400 megarads sufficient to effect chain cleavage without depolymerization to increase formaldehyde release upon subsequent heating of the package.

4,050,577

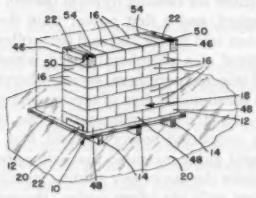
REFRACTORY STRUCTURE AND METHOD

John A. Boren, Greensboro, N.C., assignor to North State Pyrophyllite Company, Greensboro, N.C.

Continuation of Ser. No. 393,947, Sept. 4, 1973, abandoned. This application May 17, 1976, Ser. No. 686,929

Int. Cl.² B65D *85/46, 65/00*

U.S. Cl. 206—322 **5 Claims**



1. A package containing refractory blocks for transportation to a desired location for forming a monolithic wall comprising: a base support means, a plurality of massive plastic refractory blocks stacked on said support means, certain of said blocks being fired, and other blocks being unfired, a pair of complementary wedge shaped blocks, being located at each corner of the top of the stacked blocks, at least the outer of said pair being a fired block, lifting means being supported by said blocks, corner reinforcing means positioned to engage said fired blocks, and binding means surrounding said blocks and said lifting means whereby said blocks and said lifting means are rigidly united by said binding means, said pairs of blocks being located so as to urge the top of said stacked blocks into stacked alignment.

4,050,578

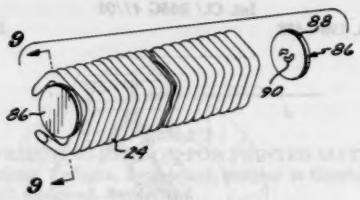
MANDREL AND CLIP MAGAZINE FOR CLIP DISPENSER AND APPLICATOR

Robert L. Eckert, 11231 Foster Road, Los Alamitos, Calif. 90720

Division of Ser. No. 517,516, Oct. 24, 1974, Pat. No. 3,945,238. This application Feb. 4, 1976, Ser. No. 655,081

Int. Cl.² B65D *83/00, 85/24, 85/62*

U.S. Cl. 206—340 **6 Claims**



1. A magazine comprising a mandrel and, supported thereon, a stacked array of a plurality of single-open-sided, diamond-shaped metal clips, said mandrel being an elongated rod member having opposite, coextensive rounded edges to engage only the inner wall of said clips adjacent the opposite side apexes of said clips,

a coextensive rounded edge along the side of said rod opposite of the open side of said clips to engage only the inner wall of said clips adjacent the other apex of said clips; and

removable clip retainer means in the form of buttons with lock means permitting their removable engagement with each end of said rod and of sufficient lateral dimensions to function, when so engaged, as stop means preventing movement of said clips over the end of said rod.

4,050,579

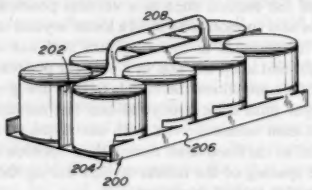
PACKAGE FOR ORIENTING A PLURALITY OF ARTICLES

Dennis M. Gorski, Allendale; Dieter Neuber, Upper Saddle River, both of N.J., and Martin Michael Wildmoser, Staten Island, N.Y., assignors to Arenco Machine Company, Inc., Teterboro, N.J.

Filed Nov. 1, 1976, Ser. No. 737,836

Int. Cl.² B65D *73/00*; B65B *15/00*

U.S. Cl. 206—460 **22 Claims**



1. A package for packaging a plurality of articles in a fixed orientation with respect to each other comprising:

a rigid blank having first and second sides, said rigid blank being a T-shaped member including a base wall and a divider wall which define an article support member on each side of said divider wall;

each article support member including an adhesive strip on the divider wall of each of said article support members;

a row of articles disposed on one of said article support members and another row of articles disposed on the other of said article support members so that said articles adhere to the adhesive strip on each side of said divider wall and are thereby held in a fixed orientation with respect to each

other, said rows of articles on either side of said divider wall being supported by the base wall of each of said article support members; and

a wrapping film covering the four sidewalls of the package, with at least one end wall being exposed.

4,050,580

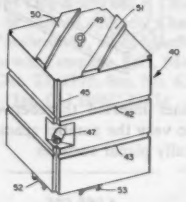
PROCESS CONTAINER

William Wilson, 716 Scott St., Stroudsburg, Pa. 18360

Division of Ser. No. 321,436, Jan. 5, 1973, abandoned. This application Feb. 3, 1975, Ser. No. 546,354

Int. Cl.[2] B65D *21/02, 19/08, 7/34*

U.S. Cl. 206—511 **10 Claims**



1. An enclosed multiwall container comprising: an upper end wall member; a lower end wall member; side wall members; each side wall member connected to said upper end wall member and said lower end wall member; at least one vertical channel member connected to said upper end wall member and said lower end wall member, each said channel member separating adjacent side wall members and turned outwardly to form a recessed corner along adjacent side wall members; at least two adjacent side wall members having horizontal means extending along each side wall member from a recessed corner, said horizontal means adapted for interconnection of the container with V-shaped arms of a retaining device; and said upper end wall member and lower end wall member each having two separate projecting hourglass shaped members positioned parallel to each other, each said hourglass shaped member being narrowest at the midsection of its hourglass shape, and the hourglass shaped member projecting from the upper end wall member are of slightly different size than the hourglass shaped members projecting from the lower end wall member such that hourglass shaped members on different containers will nest with each other when one container is stacked on another.

4,050,581

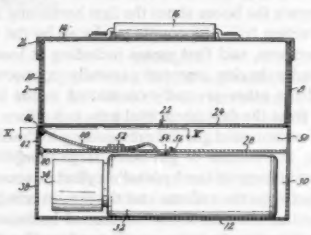
LUNCH BUCKET AND BEVERAGE BOTTLE COMBINATION

Raymond Sedlacek, 354 N. K St., Lakeview, Oreg. 97630

Filed June 11, 1976, Ser. No. 695,182

Int. Cl.[2] B65D *43/16;* H45C *11/20*

U.S. Cl. 206—544 **5 Claims**



1. A lunch bucket and beverage bottle combination comprising:

a. a lunch bucket having internal members dividing the interior thereof into a food compartment and a bottle compartment, said compartments being separate and unconnected with each other, sealed from each other internally of said bucket, and having separate, spaced apart openings outwardly from said bucket,

b. a beverage bottle carried removably in said bottle compartment, the separate relation of said compartment preventing any possibility of liquid leaking from said bottle reaching said food compartment,

c. a friction device operable when engaged to resist movement of said bottle from said bottle compartment through the outward opening of said compartment, and

d. operating means carried by said bucket and operable selectively to engage or disengage said friction device.

4,050,582

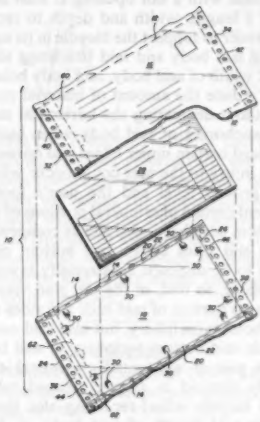
SEALED ENVELOPE ASSEMBLY WITH LOCKING POCKETS FOR FREE INSERT MATERIAL

Uldis H. Kalve, Lisle, Ill., assignor to Wallace Business Forms, Inc., Hillside, Ill.

Filed Aug. 11, 1976, Ser. No. 713,539

Int. Cl.[2] B65D *27/34*

U.S. Cl. 206—627 **12 Claims**



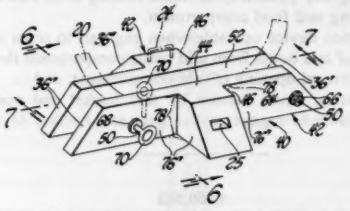
1. A stuffed, sealed envelope assembly comprising an envelope having front and back plies and at least one insert ply between said front and back plies, said envelope having lines of adhesive adjacent the peripheral edges of said front and back plies for uniting said front and back plies to form a generally sealed assembly, said lines of adhesive being spaced from the periphery of said insert ply so that said insert ply lies wholly within the enclosure of said envelope bounded by said lines of adhesive, said back ply having a plurality of spaced embossments located inwardly of said lines of adhesive and adjacent the periphery of said insert ply, each of said embossments comprising a tab having a base portion integrally secured to said back ply along a substantially straight deflection line and a free portion deflected towards said front ply in substantial overlapping relationship with said insert ply so as to form a locking pocket therefor, said insert ply being maintained in desired registration within said envelope during machine processing by such locking pockets, said lines of adhesive being discontinuous, the discontinuities therein occurring at least adjacent said embossments, said front and back plies having corresponding lines of weakening disposed inwardly of the deflection lines of said embossments along at least one side of said envelope whereby separation of the plies along the lines of weakening opens said envelope assembly and frees said insert ply from the locking pockets along said one side.

4,050,583

BICYCLE STAND

Michael V. Szabo, 109 N. Washington, Oxford, Mich. 48051

Filed Oct. 14, 1975, Ser. No. 622,028
Int. Cl.[2] A47F 7/00
U.S. Cl. 211—20 4 Claims



1. A bicycle stand, comprising a three-dimensional main body having length, width and height to provide a flat top, a flat bottom parallel to said top and oppositely-disposed flat sides and ends between said top and bottom, said sides and ends defining the periphery of said body, said body being adapted to be used either above ground level or buried below ground level and formed with a slot opening at least at said top, said slot being of a length, width and depth to receive a bicycle wheel in a manner to support the bicycle in its upright position, the lengths of said body and said slot being aligned, at right angles to said width of said body, said body being formed with means to (a) reduce the amount of material required to form the same, without decreasing the horizontal stability thereof, (b) improve anchoring of said body when buried and (c) reduce as a hazard certain upper edges and corners of said body on which leg injury to the user could occur when said stand is used above ground level and the user's foot is positioned closely adjacent certain pheripheral portions of said body, at or near said bottom periphery, said means comprising at least one of said ends and sides above said bottom periphery being formed so as to be disposed substantially inwardly from said bottom periphery, so that, in the top plan view of said body, not only does no portion of said ends and sides of said body lie outside said bottom periphery, but also said ends and sides lie entirely within said bottom periphery of said body, said body comprising a pair of substantially identical elongated body halves fixedly secured in aligned, spaced relation so as to provide said bicycle wheel-receiving slot therebetween extending along said length of said body, each of said body halves being formed with a passage extending transversely therethrough adjacent each end thereof and said stand further comprising a spacer with a passage therethrough disposed between said halves at said ends thereof adjacent and aligned with said passages in said body halves and a connecting member extending through each of said aligned passages and spacers, the distance between said spacers being less than the diameter of the bicycle wheel, whereby the bicycle wheel can be supported vertically by said spacers, between said body halves.

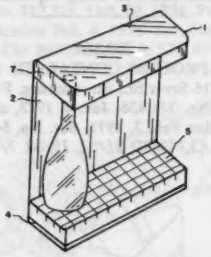
4,050,584

SELF-SEALING HOLDER FOR CONTAINERS

John Louis Lino, 1535 Anderson Ave., Fort Lee, N.J. 07024

Filed Jan. 27, 1976, Ser. No. 652,830
Int. Cl.[2] A47B 73/00; A47G 23/02
U.S. Cl. 211—76 10 Claims

1. A self-sealing holder for containers comprising, a first support member having a generally planar surface and a first resilient deformable material having a generally planar surface and fixed to the first support member, said resilient deformable material being adapted to exert pressure against the open mouth of a container placed in contact therewith, a second support member having an adjustable leg that is approximately perpendicular to and secured to the first support member and with a base member extending from the second support member and having a flat surface that forms a second generally planar surface parallel to and spaced apart from the first planar surface with the resilient material facing said second planar surface so that the two facing surfaces will seal and retain in



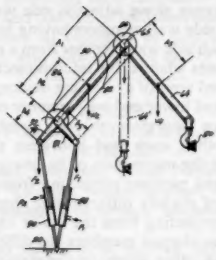
position a container inserted therebetween, said leg being adjustable so as to vary the parallel spacing between the first and second generally planar surfaces.

4,050,585

HYDRAULICALLY BALANCED MARINE LOADING ARM

Carl A. Wilms, La Habra, Calif., assignor to Ameron, Inc., Monterey Park, Calif.

Filed Nov. 7, 1975, Ser. No. 629,876
Int. Cl.[2] B67D 5/04; F16L 27/00
U.S. Cl. 212—48 5 Claims



1. An articulated loading arm structure for transferring fluid, comprising: a supporting base, a column rotatably supported on the base for rotation about a vertical axis, a boom means hingedly securing the boom at one end to the column for rotation of the boom about a first horizontal axis, an outer arm, means hingedly connecting one end of the arm to the outer end of the boom for rotation about a second horizontal axis parallel to the first axis of rotation of the boom, first means connected between the column and the boom means exerting a couple tending to rotate the boom about the first horizontal axis in the opposite direction from the couple produced by the weight of the boom and arm, said first means including at least one hydraulic cylinder having one end pivotally connected to the column and the other pivotally connected to the boom at a point offset from the first horizontal axis, and means including a volume of compressed gas for pressurizing hydraulic fluid in the cylinder, the volume of gas being large compared to the displacement volume of the hydraulic cylinder, second means connected between the column and the arm exerting a couple tending to rotate the arm about the second horizontal axis in the opposite direction from the couple produced by the weight of the arm, said second means including a lever arm rotatable about said first horizontal axis, and linkage means coupling the lever arm to the outer arm, the linkage means maintaining the lever arm and outer arm in fixed angular relationship relative to each other as they rotate about said first and second horizon-

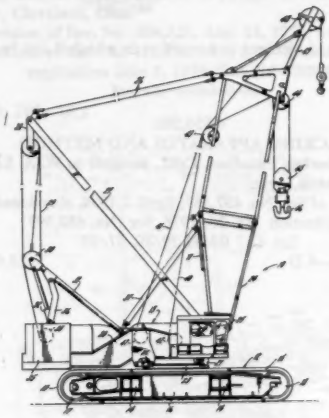
tal axes, the second means further including at least one hydraulic cylinder having one end pivotally connected to the column and the other end connected to the lever arm, and means including a volume of compressed gas for pressurizing hydraulic fluid in the hydraulic cylinder, the volume of gas being large compared to the displacement volume of the hydraulic cylinder, and means for adjusting the pressure of the gas for pressurizing the hydraulic fluid respectively in the first and second hydraulic cylinders.

4,050,586

APPARATUS FOR RAISING & LOWERING A MAST AND BOOM ON A MOBILE CRANE

James G. Morrow, Sr.; David J. Pech; Charles A. Hunter, II, and Kenneth J. Porubcansky, all of Manitowoc, Wis., assignors to The Manitowoc Company, Inc., Manitowoc, Wis.

Filed Oct. 23, 1975, Ser. No. 625,197
Int. Cl.² B66C *23/54*
U.S. Cl. 212—59 R **7 Claims**



1. A self-erecting mast and boom assembly for a lift crane having a supporting bed comprising, in combination, a mast and a gantry each pivotally mounted adjacent one end thereof on the bed such that the mast rests on a portion of the gantry when the mast and gantry are both pivoted down into substantially horizontal, rearwardly extending positions, means including a first hydraulic cylinder connected between the bed and the free end of the gantry for raising the gantry to working position and the mast to a rearwardly inclined intermediate position, and means including a second hydraulic cylinder connected between the bed and the mast for pivoting the mast from said intermediate position past vertical to a forwardly inclined position.

4,050,587

HOIST AND DOLLY APPARATUS

George A. Moen, 827 W. 26th Ave., Anchorage, Alaska 99503

Filed Aug. 16, 1976, Ser. No. 714,305
Int. Cl.² B66C *23/06*
U.S. Cl. 212—59 R **5 Claims**

1. A hoist and dolly structure for raising and transporting an object relative to a horizontal surface, comprising

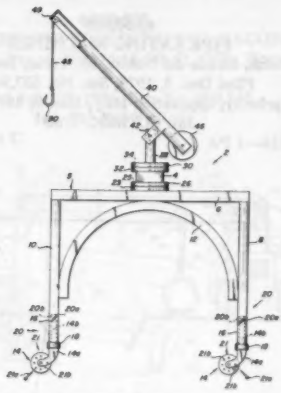
a. a horizontal center bar body member (4);

b. unitary leg means (5) arranged at each end of said body member for supporting the same relative to a fixed surface, each of said leg means including

1. a U-shaped leg member having a pair of vertical leg portions (8, 10), and a horizontal bridging portion (6) connected between the upper ends of said leg portions, the length of said leg portions being at least as great as the length of said bridging portion; and

2. a unitary U-shaped brace bar (12) having a curved central portion connected with the center of said bridging portion, and a pair of downwardly depending arm portions connected intermediate the ends of said leg portions;

c. means (22) pivotally connecting the bridging portions of said leg means with opposite ends of said body member for pivotal movement about vertical pivot axes, respectively;



d. wheel means (14) connected with the free lower ends of each of said leg portions, respectively; and

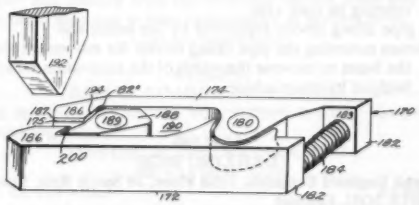
e. lifting means connected with the center portion of said body member for raising the object relative to the horizontal surface, whereby the dolly structure may be transported either laterally or longitudinally in straddling relation to a position above said object, whereupon the object may be lifted by said lifting means for transport by said hoist and dolly structure.

4,050,588

AUTOMATIC MINE CAR COUPLING

Harry Miller, Scott Depot, WVa. assignor to Lester Construction Co., Hurricane, W. Va.

Filed Apr. 23, 1976, Ser. No. 679,765
Int. Cl.² B61G *1/36*
U.S. Cl. 213—75 B **17 Claims**



1. A car coupling device comprising in combination a receiving assembly comprising a pair of jaw members pivotally mounted to each other, each jaw member including an arm having a hook shaped end, spring means mounted to each of said jaw members and acting upon the jaw members forcing their arms towards each other, a latch block assembly mounted to an adjacent car, said latch block assembly comprising an arrowhead shaped member mounted on said adjacent car, said arrowhead member comprising an arrowhead shaped portion and a "T" shaped stem secured to said arrowhead shaped portion, said arrowhead shaped portion defining an aperture

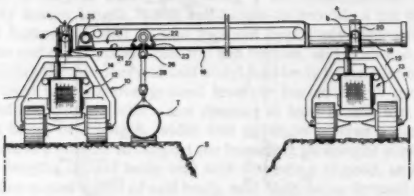
adapted to receive pin means to hold said arrowhead shaped portion pivotally in place on a car, a cam assembly moveably mounted on said car above said arrowhead member, said cam assembly having a wedge shaped portion adapted to be reciprocated downward so that the wedge portion strokes the end of the jaw members forcing them apart against the action of the spring means a distance at least equal to the width of the arrowhead shaped member to allow the arrowhead shaped member to be withdrawn from the jaw members after it has coupled with the receiving assembly.

4,050,589

PIPE LAYING MACHINES

Claudio Dolza, Strada del Nobile, 39, Turin, Italy

Filed Dec. 5, 1975, Ser. No. 637,946
Claims priority, application Italy, Dec. 9, 1974, 70565/74
Int. Cl.[2] B65G *7/00*
U.S. Cl. 214—1 PA **7 Claims**



1. A pipe-laying machine for laying large diameter pipe into an excavation, comprising in combination:

two self-propelled trucks adapted to traverse along the respective opposite banks of the excavation;

an upstanding supporting frame on each truck;

a transverse beam extending between the frames of the respective trucks to bridge the excavation;

means connecting the transverse beam with each of the two frames in such a manner as to permit the beam to adopt a variable inclination, at least one said connecting means permitting longitudinal sliding movement of the beam relative to the frame so that the beam can adopt a variable span, each connecting means comprising an articulation member in the form of a spherical joint consisting of a fork rotatably supported by the frame around an axis perpendicular to the base plane of the truck, said fork carrying a pivotably mounted ring capable of angular movement around an axis orthogonal to the first axis, whereby to permit the beam to assume any orientation relative to the vertical and horizontal planes, and the beam being supported by the pivotably mounted rings to be capable of rotating its own axis;

a pipe lifting device supported by the beam; and

means mounting the pipe lifting device for movement along the beam to traverse the width of the excavation which is bridged by the machine.

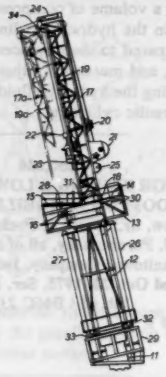
4,050,590

DRILLING RIGS

Joseph Reginald Benjamin, Fifth Floor, 38 Savile Row, London W1X 2QU, England

Filed June 28, 1976, Ser. No. 700,474
Claims priority, application United Kingdom, July 4, 1975, 28401/75
Int. Cl.[2] E21B *19/00*
U.S. Cl. 214—2.5 **4 Claims**

1. A drilling rig assembly comprising a drilling platform mounted on the casing of a pile through which drilling may be performed, storage means for elements of a drill string and lifting means on said platform for lifting said elements and transferring them to a bore within said pile, wherein said storage means comprises a rotatable cage mounted on said casing below said platform to rotate about the axis of said casing, said cage being arranged to carry a plurality of said elements located parallel to said axis, and means for rotating said cage to



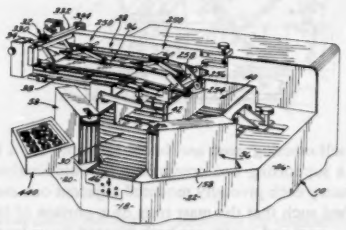
bring a selected element to a position in which it can be lifted by said lifting means.

4,050,591

STACKING APPARATUS AND METHOD

Clifford E. Dunlap, Pasadena, Calif., assignor to W. A. Krueger Co., Scottsdale, Ariz.

Continuation of Ser. No. 457,367, April 2, 1974, abandoned. This application Jan. 26, 1976, Ser. No. 652,397
Int. Cl.[2] B65H *29/60, 31/30*
U.S. Cl. 214—6 D **12 Claims**



1. In an apparatus for stacking generally flat objects in separate first and second bins arranged generally side by side, each bin having a generally open front, a single upwardly facing forwardly moving output conveyor means disposed in front of said bins and adapted to receive stacks of said objects from the open fronts of said bins, first and second stack moving means operatively associated with the respective first and second bins for sequentially moving first and second completed stacks of said objects out of the respective first and second bins successively onto said forwardly moving output conveyor means, at least one of said stack moving means comprising upwardly facing, forwardly moving live roller means in the bottom of the respective bin, blades disposed between said live rollers and adapted to be adjusted vertically to extend above said rollers for supporting objects during the formation of a stack, and continuously rotating cam means directly supporting said blades and synchronized with the stacking of objects in the corresponding bins for raising said blades to an upper position during stacking of objects thereon and thereafter lowering said blades to drop the stack of objects onto said live roller conveyor means for removal of the stack from the corresponding bin.

10. In apparatus for stacking generally flat objects in separate first and second bins arranged side by side, each bin having

an open front, a single output conveyor extending forwardly from in front of said bins, means to move stacks alternately from said bins, and merging means disposed forwardly of at least one of said bins and operatively associated with said output conveyor so as to intercept each of said stacks from said one bin and deflect them laterally generally into alignment with said output conveyor while maintaining said stacks oriented as originally formed in said bins, said merging means comprising a pusher edge constituting abutment means extending vertically for the full height of a stack, and means to move said abutment means into engagement with a central portion of the side face of the stack as the latter moves from a bin toward said output conveyor means and to push said stack laterally to give it an angular component of movement to thereby align the same with said output conveyor means as it moves onto the same without distributing the orientation of the stack.

4,050,592

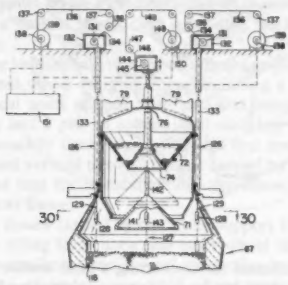
CHARGING APPARATUS FOR SHAFT FURNACES

Melvin J. Greaves, Cleveland, and Frank V. Razgaitis, Seven Hills, both of Ohio, assignors to Arthur G. McKee & Company, Cleveland, Ohio

Division of Ser. No. 604,328, Aug. 13, 1975, which is a continuation of Ser. No. 411,924, Nov. 1, 1973, abandoned. This application July 1, 1976, Ser. No. 701,954

Int. Cl.[2] C21B 7/20

U.S. Cl. 214—18.2 15 Claims



1. Apparatus for charging particulate material into a receptacle to form a stockline in the receptacle, said apparatus comprising an inner wall of the receptacle defining a zone in which said stockline is to be located; distributor means for distributing particulate material in said receptacle to form said stockline comprising a bell in said receptacle and a member surrounding said bell, said member having a bottom opening into which at least a portion of said bell may extend during operation of said distributor means; means for causing relative movement between said bell and said surrounding member during the distributing operation; means for determining the configuration of said stockline comprising means for sensing the level of said stockline at a plurality of locations thereon near said inner wall of said receptacle and at a location substantially at the center of said stockline and beneath said bell, and means associated with said sensing means for indicating outside of said receptacle the level of the stockline in each of said locations to permit operation of said charging apparatus including said distributor means to be controlled to discharge particulate material to correct undesired deviations in the level of said stockline.

13. A process for charging particulate material into a receptacle comprising an inner wall defining a zone in which a stockline is to be located and distributor means for distributing particulate material in said receptacle to form said stockline comprising a bell in said receptacle and a member surrounding said receptacle, said member having a bottom opening into which at least a portion of said bell may extend during operation of said distributor means and means for causing relative movement between said bell and said surrounding member during the distributing operation, said process comprising the steps of sensing the level of the stockline at a plurality of locations thereon near the inner wall of said receptacle and at a location substantially at the center of said stockline and beneath said bell, receiving outside of the receptacle the information as to the stockline level at each of said locations, and controlling the operation of said distributor means for distributing particulate material to achieve a desired stockline configuration on the basis of information received from said sensing means.

4,050,593

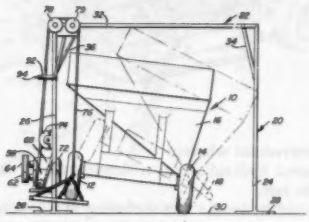
SIDE LIFT FOR SIDE DUMPING WAGONS

Henry J. Kalke, Rte. 1, Box 24 12-6th St., NE., Nora Springs, Iowa 50458

Filed Feb. 23, 1976, Ser. No. 660,144

Int. Cl.[2] B65G 67/42

U.S. Cl. 214—44 C 9 Claims



1. A side lift for side dumping wagons of the type including opposite side front and rear wheels, said lift including upstanding support means having a pair of horizontally spaced elevated support portions, a pair of depending flexible tension members freely dependingly supported from said support portions and disposed in an upstanding plane spaced horizontally outwardly from one side of the lower end portion of said support means, an elongated horizontal lift member spaced horizontally outwardly from said one side of said support means, the lower ends of said tension members being anchored to opposite end portions of said lift member for support thereof solely from said tension members, force means connected between said support means and said tension members for selectively and equally elevating and lowering the lower ends of said tension members relative to said support portions, said lift member being adapted to have the adjacent side front and rear wheels of a side dumping wagon spaced outwardly of said one side of said support means roll thereonto from one end thereof and thereoff from the other end thereof when said lift member is disposed at least substantially at ground level.

4,050,594

REFUSE LOADING APPARATUS

Cyril R. Gollnick, Oshkosh, Wis., assignor to Leach Company, Oshkosh, Wis.

Filed Oct. 20, 1975, Ser. No. 623,605

Int. Cl.[2] B65F 3/00

U.S. Cl. 214—83.3 4 Claims

1. In a refuse collection and transport vehicle of the type having a refuse storage body and a hopper for receiving refuse therein, loading apparatus for transporting batches of refuse from said hopper to said storage body, said loading apparatus including:

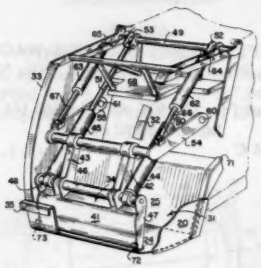
means including a packer plate positioned in said hopper for removing refuse therefrom,

actuating means including means for supporting said packer plate in said hopper,

said actuating means having means including a first hydraulic ram mounted in operative communication between said packer plate means and either one of said hopper and said

storage body for controlling the vertical position of said packer plate in said hopper and means including a second hydraulic ram mounted in operative communication between said packer plate means and either one of said hopper and said storage body for urging said packer plate through said hopper;

said first hydraulic ram and said second hydraulic ram coacting to move said packer plate on an operating path therethrough so as to scoop batches of refuse contained therein into said storage body; and



the improvement wherein

said second hydraulic ram is dominant over said first hydraulic ram,

said second hydraulic ram including means acting through said packer plate means for changing the movement of said first hydraulic ram against the direction of energised movement thereof, and

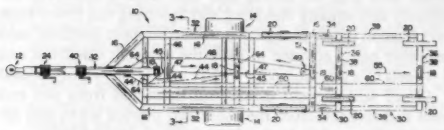
said change in movement of said first hydraulic ram being capable of extending over a substantial portion of the total operative length of travel thereof.

4,050,595

BOAT TRAILER EXTENSION ASSEMBLY

Leon M. Bussard, New Port Richey, Fla., assignor to Leon M. Bussard and C. Ed Smith, both of New Port Richey, Fla.

Filed Dec. 29, 1975, Ser. No. 644,971
Int. Cl.² B60P 3/10
U.S. Cl. 214—84 **8 Claims**



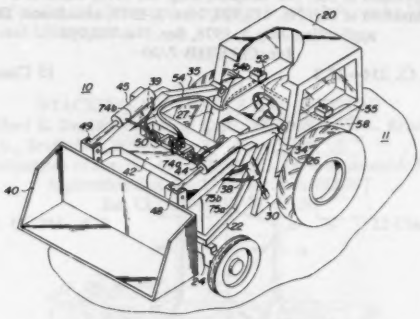
1. A removable accessory for a conventional boat trailer have rearwardly extending frame portions, said accessory including a support assembly comprising: casing means connected to the frame portions of the boat trailer and disposed substantially along either side of a longitudinal axis thereof, said casing means comprising at least two channel means interconnected to one another and each disposed in depending, suspended relation to correspondingly positioned elongated portions of the boat trailer frame, each channel means defining cradle passages; said support assembly further comprising cradle means including a cradle frame, said cradle frame including at least two arm elements each slidably mounted for rearward movement within one of said cradle passages; positioning means movably interconnecting said cradle frame to said casing means and said cradle passages attached thereto, said positioning means comprising a single winch assembly mounted on the boat trailer, cable means comprising a first cable portion interconnected between said single winch assembly and said cradle frame and a second cable portion disposed in attached relation to both said single winch assembly and said cradle frame, pulley means connected to the boat trailer frame and disposed in engagement with said second cable portion between said winch assembly and said cradle frame along the path of travel defined by said second cradle portion; said cradle frame including a strut means attached thereto, each of said first and second cable portions connected to said strut means, and both of said first and second cable portions additionally connected concurrently to said single winch assembly, whereby rotation of said winch assembly in either direction causes movement of said cradle means relative to the longitudinal axis of the boat trailer.

4,050,596

ELECTROHYDRAULIC VALVE ASSEMBLY FOR FRONT END LOADER ATTACHMENT TO FARM TRACTOR

Kenneth W. Zeuner, Newtown, and Alonzo B. Jarman, Wrightstown, both of Pa., assignors to Control Concepts, Inc., Newtown, Pa.

Filed July 24, 1975, Ser. No. 598,726
Int. Cl.² E02F 3/74
U.S. Cl. 214—131 A **12 Claims**



1. In an attachment for converting a farm tractor having a cab to a front end loader, front frame members extending to the front of said tractor, upwardly extending frame members rigidly secured to said front frame members and providing a supporting pivotal connection for a pair of boom arms, a pair of hydraulic cylinders for actuating said boom arms, an implement pivotally connected to said boom arms and being actuated by at least one additional hydraulic cylinder, said front and upwardly extending frame members being secured to said tractor, in which the improvement combination comprises

an electrohydraulic valve assembly having solenoid operated valves, said valve assembly being hydraulically coupled to said pair of cylinders and said additional cylinder and rigidly secured to said attachment outside of said cab,

a switching assembly comprising a plurality of switching devices adapted for electrically switching said solenoid operated valves thereby to control said hydraulic cylinders, said switching assembly secured within said cab for easy access to the operator of said plurality of switching devices,

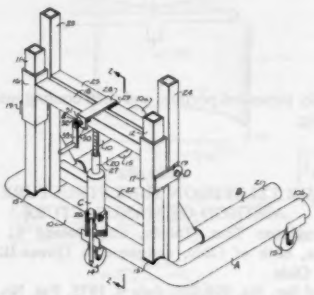
electrical cable means coupled between said switching assembly within said cab and said electrohydraulic valve assembly outside of said cab thereby avoiding hydraulic oil lines and valves within said cab, and

means directly electrically connecting only a first and a second of said switching devices respectively to a first and a second pair of said solenoid valves, said valve assembly including an unload valve normally maintained open and hydraulically coupling the pressure and tank of said tractor whereby upon actuation of each switching device one solenoid valve of the respective pair is energized and said unload valve is switched to the valve closed state.

4,050,597
DOLLY FOR LIFTING AND TRANSPORTING VEHICLE WHEELS

Wallace H. Hawkins, Rte. 7, Buncombe Road, Greenville, S.C. 29609

Filed Nov. 6, 1975, Ser. No. 629,587
Int. Cl.[2] B60B 29/00; B65G 7/00
U.S. Cl. 214—331 2 Claims



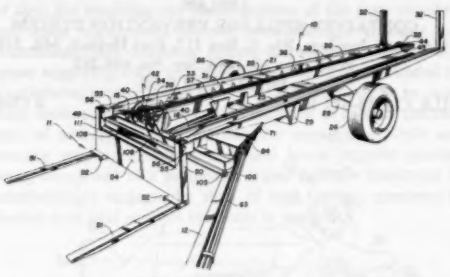
1. A wheel dolly including:
a substantially L-shaped wheeled outer support frame;
said support frame including a pair of spaced vertical posts and a pair of spaced legs extending horizontally therefrom;
an inner substantially L-shaped wheel carrying frame;
said inner wheel carrying frame including a pair of spaced vertical posts aligned with said first mentioned vertical posts and a pair of spaced load carrying legs extending horizontally therefrom within said first mentioned legs;
elongated vertical sleeves (means) carried by said first mentioned legs for vertical sliding movement on said outer support frame;
jacking means carried by said outer support frame for exerting a lifting force upon said inner wheel carrying frame;
a transverse horizontal pivotal connection between a lower portion of said sleeves (said means carried for vertical sliding movement) and said inner wheel carrying frame; (and)
a horizontal bridging member connecting upper portions of said sleeves;
a horizontal bridging member connecting said spaced vertical post of said inner wheel carrying frame opposite said first mentioned bridging member; and
threaded means exerting a force between said bridging members for tilting said inner wheel carrying frame about said pivotal connection restraining said inner wheel carrying frame in tilted position for maintaining a wheel supported thereby in proper position in respect to a vehicle axle.

4,050,598
BALE WAGON

James L. Schurz, New Hope, Minn., assignor to Farmhand, Inc., Hopkins, Minn.

Filed Apr. 14, 1975, Ser. No. 567,609
Int. Cl.[2] B60P 1/38
U.S. Cl. 214—518 5 Claims

1. A wheel supported bale wagon for loading and transporting bales of a size generally incapable of being handled and maneuvered by a single person, said bales having a pair of end surfaces defining the transverse dimension of such bale and at least one side surface extending between the end surfaces and defining the length of such bale, said wagon comprising:
a generally elongated frame having a bale supporting portion;
loading means pivotally connected at the forward end of said elongated frame about a generally horizontal axis for loading the bale onto said bale supporting portion at the forward end of said elongated frame;
means for pivoting said loading means between a lower position and an upper position;
conveying means for conveying the bale from said one end of the elongated frame to a selected position along said elongated frame; and
a tongue section having hitch means for connection to a draft vehicle, said tongue section being movable between a trailing position in which the wagon trails approximately directly behind the draft vehicle and an operative position in which the wagon trails the draft vehicle generally to one side thereof;

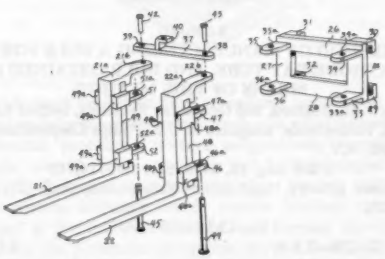


a support means movable between a raised position and an operative position in which said support means functions to support the wagon and operatively connected with said elongated frame near its forward end and on the side of said frame opposite said tongue section for supporting said wagon when said tongue section is in its operative position; and
means operatively connected between said tongue section and said support means for moving said support means between said raised and operative position in response to movement of said tongue section between a trailing and operative position, respectively.

4,050,599
APPARATUS FOR ANGULATING FORKS ON A FORK LIFT TRUCK

Frank N. Bender, P.O. Box 11430, Reno, Nev. 89510

Continuation-in-part of Ser. No. 563,773, March 31, 1975, abandoned. This application Mar. 15, 1976, Ser. No. 666,698
Int. Cl.[2] B66F 9/14
U.S. Cl. 214—730 4 Claims



1. In a fork lift truck with a carriage for vertical movement, apparatus for remote control angulation of load bearing forks comprising: a frame with means for detachably mounting said frame to said fork lift truck carriage, the frame having at least two outwardly projecting elements; a first mounting for attaching a forwardly extending first fork, said first mounting having at least one rearwardly extending bracket to pivotally cooperate with at least one of the outwardly projecting ele-

ments of the frame; a second mounting for attaching a forwardly extending second fork, said second mounting having at least one rearwardly extending bracket to pivotally cooperate with at least one of the outwardly projecting elements of the frame; each fork having an arm extending rearwardly to a greater extent than the respective rearwardly extending bracket; a device connected to both rearwardly extending arms; and, means attached to the device wherein the load bearing forks can be turned in equal angular proportions about their own individual pivot axis from a remote location, whereby said forks can be pivoted with a load resting on said pair of forks.

4,050,600

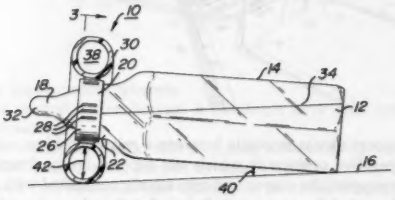
CONTAINER SPILLAGE PREVENTION SYSTEM

Martin C. Jennings, Rte. 1, Box 112, Port Deposit, Md. 21904

Filed June 15, 1976, Ser. No. 696,262

Int. Cl.² A61J 9/00

U.S. Cl. 215—11 R **8 Claims**



1. A container spillage prevention system for material within said container, comprising:

a. a cap member adapted to matingly engage said container adjacent an open end of said container, said cap member having a through opening for securement thereto of a material dispensing element, said cap member having an external diameter defining a cap member lateral wall, said cap member having radially directed extension members formed on said lateral wall; and,

b. means for elevating said material dispensing element a predetermined distance above a substantially horizontal surface, said elevation means being secured to said cap member lateral wall in deformable mating engagement with said extension members, said elevation means forming a doughnut shaped contour generated by a circle rotated about an axis in the plane of said circle, said elevation means having an external diameter substantially greater than a largest diameter of said container.

4,050,601

METHOD OF MANUFACTURING A BULB FOR A CATHODE-RAY TUBE, AND BULB OBTAINED BY MEANS OF THIS METHOD

Johan J. H. Bogaard, and Gerrit-Jan Korteling, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

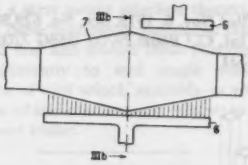
Filed Aug. 16, 1976, Ser. No. 714,741

Claims priority, application Netherlands, Aug. 27, 1975, 7510101

Int. Cl.² C03B 23/08

U.S. Cl. 220—2.1 A **5 Claims**

1. A method for manufacturing a bulb having a cylindrical neck joined to a polygonal section, comprising heating a central portion of a glass tubing to its softening temperature while rotating said glass tubing about its axis at a rate such that the softened portion of the tubing radially expands, simultaneously upsetting said softening of said glass tubing by axially displacing the end portions of said glass tubing at a rate to maintain the wall thickness of said central portion substantially constant, then stopping the rotation of said glass tubing and reshaping the radially expanded portion thereof to have a polygonal cross-section without varying the circumferential dimension of



said radially expanded portion, and then cooling said reshaped glass tubing.

4,050,602

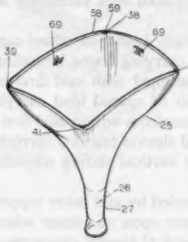
COLOR TELEVISION TUBE STRUCTURE AND METHOD OF MANUFACTURE

Elgin Megginson Tom, Toledo, and Roland L. Vogelpohl, Gahanna, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 594,531, July 9, 1975, Pat. No. 3,997,811. This application June 1, 1976, Ser. No. 691,490

Int. Cl.² H01J 29/07

U.S. Cl. 220—2.1 A **7 Claims**



1. A color television picture tube funnel comprising a glass frusto-conical body; and a seal edge on the divergent end of said body of generally rectangular perimeter having a substantially uniform width around said rectangular perimeter and of scalloped spherical contour convexly related to a center in the vicinity of the convergent end of said body, said funnel including an inner wall of said body having a plurality of spaced reference faces directed radially outward of the convergent end of said body and defined by indentations in said seal edge, said indentations extending into said seal edge in a radially outward direction, and adapted to index the depth of entry of a shadow mask structure into the divergent end of said body.

4,050,603

CLAMP FOR SECURING BAR HANGER TO ELECTRICAL WIRING BOX

Robert M. Harris, Vienna, W. Va.; Gene F. Mills, Belpre, Ohio, and David T. Shaffer, Parkersburg, W. Va., assignors to Union Insulating Company, Parkersburg, W. Va.

Filed Oct. 6, 1976, Ser. No. 729,967

Int. Cl.² H02G 3/08

U.S. Cl. 220—3.9 **7 Claims**

1. An assembly comprising:

an electrical wiring box including a wall;

a clamp including a generally U-shaped portion;

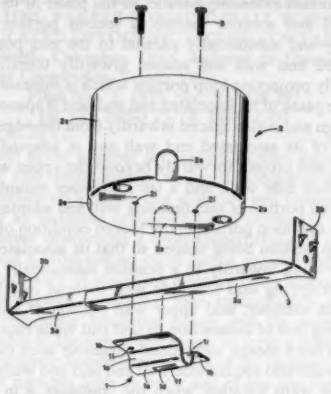
a bar hanger disposed within the U-shaped portion of the clamp and captured between the generally U-shaped portion of the clamp and the wall of the wiring box; and

securing means securing the clamp and the bar hanger

within the generally U-shaped portion of the clamp directly to the wall of the wiring box;

the improvement comprising:

the generally U-shaped portion of the clamp has deformable means directed, prior to the clamp being secured to the wall of the wiring box, into the region defined by



the generally U-shaped portion and bearing against the bar hanger, and operative during the securing of the clamp to the wall of the wiring box to deform and to move in a direction away from the wall of the wiring box and toward the generally U-shaped portion of the clamp.

4,050,604

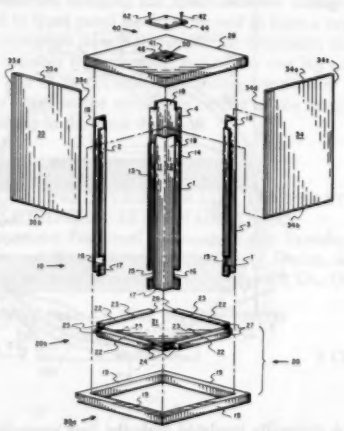
DISASSEMBLEABLE, REUSABLE CONTAINER

Robert D. Flanders, 28035 SW Parkway Ave., Wilsonville, Oreg. 97070

Filed July 22, 1974, Ser. No. 490,497

Int. Cl.[2] B65D *9/18, 7/24, 19/12, 19/16*

U.S. Cl. 220—4 F **6 Claims**



1. A disassemblable, reusable, container system which, when assembled, is storeable in a relatively small area compared to a conventional container system, for storing and shipping materials, which comprises a plurality of bracing support members, each of said bracing support members including, at its lower end, a support leg section for maintaining said container system above the level of the surface upon which it is supported; a floor member including upper and lower portions engaging and joining with said support members for supporting the material to be shipped located within the confines of said container system, and including means for engaging and joining with said bracing members; a plurality of sidewall members, having their vertical edges located within the confines of said bracing support members, said adjacent vertical edges of said sidewall members being in bearing relationship one against the other, said bracing support members interlockingly engaging said sidewalls and joining with said floor member to support said sidewall members, and an interlocking lid member, which serves as a cover for said container system by protecting said material and which interlockingly secures and maintains the container in proper vertical alignment, supported on said bracing support members and said sidewall members, respectively, each of said bracing support members including a pair of slots for receiving the lower portion of the floor member, and upon engagement thereof, interlockingly bracking and maintaining said container system in proper alignment, said upper support portion including a floor section surrounded by a peripheral groove which in turn is circumscribed by an outer floor section and having notches included in each of the corners of said upper floor portion for engagement with said bracing support members, and said lower support portion being comprised of a peripheral frame member fabricated to interlockingly engage the slots of said bracing members to further lock said support members in position.

4,050,605

PANEL ASSEMBLED TANK

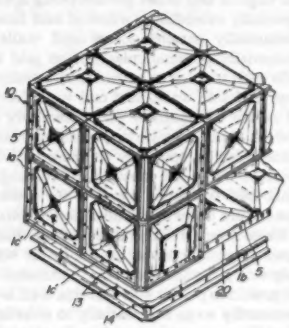
Hiroshi Wakana, Fuchu; Isamu Harada, and Tsutomu Honma, both of Kodaira, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed May 27, 1976, Ser. No. 690,819

Claims priority, application Japan, May 30, 1975, 50-71992[U]

Int. Cl.[2] B65D *7/24, 7/46*

U.S. Cl. 220—5 A **10 Claims**



1. A panel assembled tank comprising square wall surface unit panels connected together, each unit panel formed with a pyramidal protrusion portion progressively increasing in height toward the panel center and having integral folded securing flanges at the peripheral edges thereof, said protrusion portion including corner section portions radially arranged at the unit panel corners and forming therebetween edges of the pyramidal protrusion portion, said wall surface unit panels comprising bottom wall panels, at least some of said bottom panels having securing flanges folded in a direction opposite to the extending direction of said protrusion portion thereof, said panels further comprising side wall panels, each side wall panel having securing flanges folded in the same direction as the protrusion portion of the side wall panel, said side wall panels being formed peripherally along the bottoms of said flanges with flat portions, and means for securing the

flanges of said bottom and side wall panels together and facing outwardly to form said tank.

4,050,606

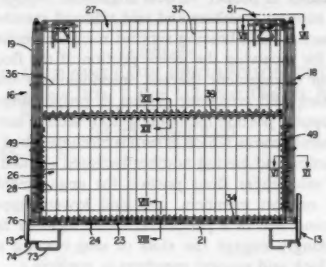
COLLAPSIBLE MATERIAL HANDLING CONTAINER

Stanley J. Jurasek, Concord Township, Jackson County, Mich., assignor to Eagle Picher Industries, Inc., Cincinnati, Ohio

Filed June 2, 1975, Ser. No. 582,780

Int. Cl.² B65D 7/24

U.S. Cl. 220—7 **1 Claim**



1. A collapsible container comprising base means defining a planar bottom wall, substantially parallel first and second planar side walls connected to said bottom wall and adapted to project substantially perpendicularly therefrom adjacent opposite edges thereof, said first side wall comprising a lower wall portion and an upper wall portion whose adjacent horizontal edges are hingedly connected together so that the upper wall portion can be swung outwardly relative to the lower wall portion, said first side wall having an inwardly directed offset portion on the lower end thereof which is substantially parallel to said bottom wall when said container is in an erected condition, the free edge of said offset portion being spaced inwardly from the upwardly extending portion of said first side wall, a pair of substantially parallel planar end walls adapted to project substantially perpendicularly from said bottom wall, said end walls each adapted to extend substantially perpendicularly between said side walls, said end walls having end portions which extend substantially perpendicularly to the planes of said end walls, said end portions extending inwardly toward each other and being substantially coplanar with said first side wall, said walls all being of a substantially rectangular configuration so that said container when in an erected condition defines an enclosure of an upwardly opening boxlike configuration, first hinge means defining a first substantially horizontal hinge axis and hingedly connecting the lower wall portion of said first side wall adjacent the lower horizontal edge thereof to said bottom wall to permit said first side wall to be vertically swung downwardly so as substantially to overlie said bottom wall, said first hinge means being hingedly connected between the free edge of said offset portion and said bottom wall, second hinge means defining a second substantially horizontal hinge axis and hingedly connecting said second side wall adjacent the lower horizontal edge thereof to said bottom wall to permit vertically swinging of said second side wall into a position wherein it overlies said bottom wall, said first and second horizontal hinge axes being substantially parallel to one another, third and fourth hinge means hingedly connecting the opposite side edges of the lower wall portion of said first side wall to the adjacent edges of said end walls to permit said end walls to be swingably displaced to substantially overlie said first side wall, said third and fourth hinge means defining third and fourth hinge axes which extend substantially vertically when the container is in an erected condition, said third and fourth hinge means hingedly connecting the inner edges of said end portions of said end walls to the opposing edges of the lower wall portion of said first side wall, first releasable latch means coacting between said upper wall portion of said first side wall and said end walls for releasably retaining said upper wall portion of said first side wall and said end walls together when the container is in an erected condition, said first releasable latch means comprising two latches respectively disposed adjacent the upper corners of said upper wall portion of said first side wall, each of said latches comprising a keeper having a first portion extending parallel to the plane of its associated end wall and secured thereto, a second portion extending inwardly and substantially parallel to the end portion of its associated end wall and spaced inwardly therefrom and a forwardly projecting loop portion which is substantially parallel to the plane of its associated end wall and is spaced inwardly therefrom and is also spaced inwardly from the edge of the end portion of its associated end wall and is adapted to extend through and project forwardly beyond the upper wall portion of said first side wall, and a latch member mounted on said upper wall portion of said first side wall and adapted to extend through said loop portion in the locked condition of said latch, said loop portion being shaped so that its associated end wall can be swung inwardly to a position substantially parallel to and overlapping said first side wall without interfering with said latch member, said upper wall portion of said first side wall being free of connection to said end walls except through said first latch means, and second releasable latch means coacting between said second side wall and said end walls for retaining these walls together when the container is in an erected condition, said second side wall being free of connection to said end walls except through said second latch means.

4,050,607

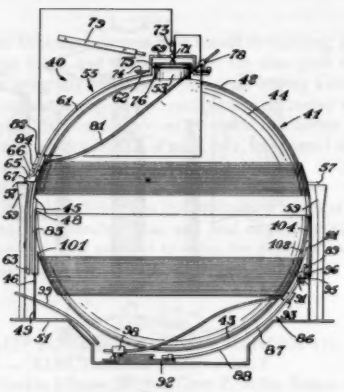
INSULATION OF VESSELS HAVING CURVED SURFACES

Hubert Stacy Smith, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 242,061, April 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 158,272, June 30, 1971, abandoned. This application June 28, 1974, Ser. No. 484,043

Int. Cl.² B65D 25/18

U.S. Cl. 220—9 LG **4 Claims**



1. A thermally insulated tank, the tank comprising

at least a first tank having an exterior curved surface,

a layer of synthetic resinous cellular foam thermal insulation disposed adjacent the exterior curved surface and covering at least a substantial portion thereof, the insulation being in the form of a plurality of loops or turns of a strip-like configuration, adjacent turns of the insulation being adhered to each other in edge to edge relationship, the adjacent turns define a plurality of spirally disposed slots facing the exterior curved surface of the tank and a

plurality of loops or turns of a vapor barrier material overlying the loops of insulating material.

4,050,608

CROSS-SHAPED JOINT COVER MEMBER FOR GENERALLY RECTANGULAR COMPOSITE INSULATING PANELS FORMING WALL PORTION OF INSULATED CRYOGENIC LIQUID CONTAINER

Roy E. Smith, Columbus, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 3, 1975, Ser. No. 628,297
Int. Cl.² B65D *25/18;* E04C *1/00*
U.S. Cl. 220—9 LG 95 Claims

1. A joint cover member for sealing a cross- shaped space separating four rectangularly arranged composite insulating panels mounted on a supporting structure and forming a wall portion of an insulated cryogenic liquid container, the joint cover member comprising a cross-shaped body of insulating material and a cross-shaped outer facing secured thereto, the cross-shaped body of insulating material being insertable in a cross-shaped space separating four rectangularly arranged mounted composite insulating panels and the outer facing being sealable to the composite panels to form a primary barrier for cryogenic liquids therewith, and the dimension of the joint cover member from an outer end of any one leg portion to an outer end of an oppositely extending leg portion being substantially equal to the dimension of one of the composite insulating panels in the same direction.

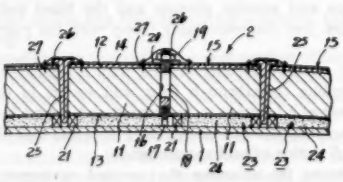
22. An insulated cryogenic liquid container comprising a supporting enclosure having a generally planar inner surface, a plurality of generally rectangular composite insulating panels each including a casing and insulating material in the casing, the panels being mounted in rows in a covering layer over the planar inner surface with a cross-shaped space separating the casings of each group of four rectangularly arranged mounted composite panels, and a plurality of joint cover members each including a cross-shaped body of insulating material and a cross-shaped outer facing, the cross-shaped bodies of insulating material being disposed respectively in the cross-shaped spaces and the outer facings covering the cross-shaped bodies of insulating material, bridging the space between casings, and being sealed to front panel portions thereof to form a primary barrier for cryogenic liquids therewith, the dimension of each joint cover member from an outer end of any one leg portion to an outer end of an oppositely extending leg portion being substantially equal to the dimension of one of the composite insulating panels in the same direction.

4,050,609

HEAT INSULATING DEVICE FOR LOW TEMPERATURE LIQUIFIED GAS STORAGE TANKS

Tomiyasu Okamoto; Tsunanori Nishimoto; Kaoru Sawada; Koji Hayakawa, and Tomomichi Kurihara, all of Osaka, Japan, assignors to Hitachi Shipbuilding & Engineering Co., Osaka, Japan

Filed Sept. 13, 1976, Ser. No. 722,718
Int. Cl.² B65D *87/24;* B63B *25/16*
U.S. Cl. 220—9 LG 9 Claims



1. In a heat insulating device for the wall of a spherical low temperature liquified gas storage tank, the improvement comprising:

a plurality of heat insulating unit block plates each consisting of a rigid foam synthetic resin plate, inner and outer plywood members bonded to the inner and outer surfaces respectively of said resin plate, a gas-tight sheet bonded to the outer surface of said outer plywood member, and a hole disposed substantially centrally of said block plate and extending through said gas-tight sheet, said plywood members and said resin plate;

a plurality of point spacers disposed between the inner surface of each block plate and the outer surface of said tank wall to define a space between the block plates and the tank wall;

heat insulating connecting means inserted in said holes for fixing said unit block plates relative to the tank wall and said point spacers;

heat insulating filler means placed in the joints between said unit block plates; and

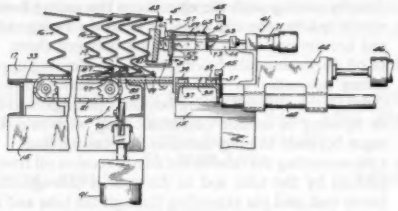
gas-tight means for covering the exposed outer portions of said connecting means and said filler means.

4,050,610

COIL SPRING FEEDING APPARATUS

Helmut Sturm, Kenosha, Wis., assignor to Frank L. Wells Company, Kenosha, Wis.

Filed Jan. 29, 1975, Ser. No. 545,095
Int. Cl.² B65H *3/16*
U.S. Cl. 221—171 10 Claims



1. Coil spring feeding apparatus comprising a frame, a coil spring magazine supported by said frame, having a discharge end, and adapted to contain a plurality of coil springs, means on said frame for conveying the coil springs in said magazine toward said discharge end, a coil spring conveyor extending transversely of said magazine adjacent said discharge end, means for withdrawing the end coil spring from said magazine and for transporting the withdrawn end coil spring from said magazine onto said conveyor and including a magnet adapted for magnetically attracting and releasably holding the end coil spring and movable across said conveyor between a retracted position on the side of said conveyor remote from said magazine discharge end and an advanced position located adjacent to said magazine discharge end in position for magnetically attracting and releasably holding the end coil spring in said magazine, means for displacing said magnet between said advanced and retracted positions to withdraw the end coil spring from said magazine and to transport the end coil spring onto said conveyor, stripper means located adjacent to said conveyor along the side thereof remote from said magazine discharge end and in the path of travel of the coil spring magnetically held by said magnet during movement of said magnet from said advanced to said retracted positions, whereby to strip the coil spring held by said magnet when the coil spring is positioned on said conveyor, a retainer finger movable between a retaining position engagable with the inside surface of the end coil spring and a non-retaining position permitting movement into and out of the interior of the end coil spring between the convolutions thereof, and means for displacing said finger transversely of said conveyor in common with said

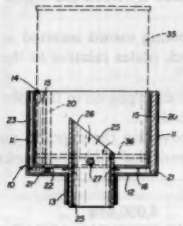
magnet and for displacing said finger between said retaining and non-retaining positions.

4,050,611

DEVICE FOR FILLING CRANK CASE OR TRANSMISSION OF INTERNAL COMBUSTION ENGINE WITH OIL

Joseph F. Frantz, 495 S. Dayton St., Denver, Colo. 80231

Filed Jan. 19, 1976, Ser. No. 650,470
Int. Cl.² B67B *7/28*
U.S. Cl. 222—88 **4 Claims**



2. A device for filling a crank case or transmission of an internal combustion engine with oil dispensed from a can comprising:

a. an open top casing having a cylindrical side wall and a bottom with an opening therein,

b. a cup member in the casing having an opening in its bottom registering with the opening in the casing bottom,

c. means spacing the cup member from the casing side wall and bottom providing air passages between them,

d. an oil dispensing tube having an oil can piercing upper end facing upwardly in the cup and extending downwardly through the cup and casing bottom openings, and having an opening in its side communicating with said air passages between the cup member and casing, and

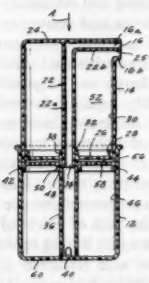
e. a pin mounting the tube in the cup to receive oil from a can pierced by the tube and to dispense it through the tube lower end, said pin extending through the tube and having ends bearing on the bottom of the cup member.

4,050,612

DISPENSING CONTAINER

Thomas Stone, Lisbon, Conn., assignor to Jules Silver, Norwich, Conn.

Filed May 25, 1976, Ser. No. 689,828
Int. Cl.² B67D *5/52*
U.S. Cl. 222—135 **11 Claims**



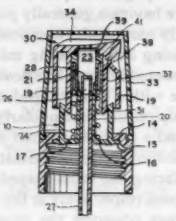
1. A dispenser for flowable materials comprising a first, open-topped container, a second open-bottomed container dimensioned to be telescopically received in said open topped container with its open bottom therein, said open-bottomed container having a dispensing orifice formed therein and containing a hollow dispensing channel communicating at one end with at least a portion of said orifice and having its other end located adjacent the open bottom of said second container; a piston received in said second container for sliding movement therein with respect to said dispensing channel; a hollow rod operatively connected to said piston and telescopically engaging and receiving said dispensing channel, said hollow rod having a bottom end engaging the bottom of said first container and having an opening therein providing communication between the interior of said first container, said hollow rod and said dispensing channel and a separator-seal member located in said first container for movement relative to said rod and in position to be engaged by the edge of said second container surrounding the open bottom thereof, whereby material contained in said first and second containers will be simultaneously discharged upon depression of the first container into the second container.

4,050,613

MANUAL ACTUATED DISPENSING PUMP

Douglas F. Corsette, 6559 Firebrand St., Los Angeles, Calif. 90045

Filed Aug. 31, 1976, Ser. No. 719,236
Int. Cl.² B05B *11/00*; B65D *47/34*
U.S. Cl. 222—321 **12 Claims**



1. A dispensing pump of the pressure accumulating type comprising a pump body and means for securing same in fluid tight communication with the opening of a container of flowable product to be dispensed;

said body including an annular base and a piston affixed to and projecting upwardly therefrom;

an annular plunger mounted for reciprocation on said piston to therewith define a variable volume pump chamber;

a plunger spring for urging said plunger upwardly toward a fully raised position above the base;

said piston and said base having a check valve controlled inlet passage therethrough for establishing communication between said pump chamber and a container of flowable product to be dispensed;

a plunger head having a downwardly directed blind socket slidably disposed on said annular plunger and therewith defining a variable volume accumulation chamber between said annular plunger and the blind end of said socket, and communicating freely with the pump chamber;

said plunger head being formed with a discharge passage extending therethrough from said socket to the atmosphere at a location to be opened and closed by relative movement between said plunger head and said plunger in the direction of said reciprocation;

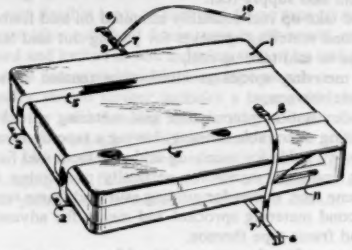
and means for arresting the upward movement of the plunger head at a predetermined position wherein said spring normally urges the said plunger fully into the said socket to function as a valve for closing said passage.

4,050,614

VEHICLE LUGGAGE CARRIER

Earl L. Simpson, 6814 Farragut Ave., Falls Church, Va. 22042

Filed Mar. 29, 1976, Ser. No. 671,064
Int. Cl.[2] B60R 9/04, 9/06
U.S. Cl. 224—29 R 13 Claims



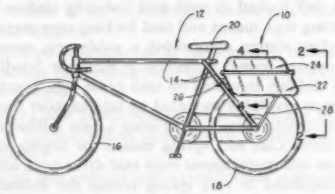
1. A vehicle luggage carrier comprising a storage container having a front end, a rear end, lateral side portions, a top side and a bottom side, means for opening and closing said storage container, at least one front hook-type means operatively associated with the front end of said storage container for engagement with a portion of the vehicle, side straps attached to said storage container and extending laterally from each lateral side portion of the storage container, lateral hook-type mens operatively attached to said side straps for engagement with lateral portions of said vehicle, one of said lateral hook-type means being fixedly attached to a side strap on one side of said storage container with the free end of said side strap extending to the top side of the storage container, the other of said lateral hook-type means being slidably attached to a side strap on the other side of said storage container with the free end of said side strap extending to the top side of the storage container and means for securing said free ends of said straps together on the top side of said storage container, so that tightening the strap results in simultaneously tightening the lateral hook-type means in their lateral directions and the storage container in the vertical direction, relative to the vehicle.

4,050,615

RIGID SADDLE BAG TYPE CARRIER FOR BICYCLES

Melbert A. Kline, 1157 Silverdale, Wichita, Kans. 67218

Filed Sept. 15, 1975, Ser. No. 613,573
Int. Cl.[2] B62J 9/00
U.S. Cl. 224—32 A 3 Claims



1. A rigid saddle bag type carrier for a bicycle, the carrier comprising:

an elongated case secured to the rear portion of the bicycle and disposed above the rear wheel axle, the case having a front portion, a rear portion, an open top portion, a bottom portion, and two side portions with each side portion positioned adjacent to a side of the wheel, the bottom portion including two horizontal surfaces with each horizontal surface positioned adjacent a side of the wheel and a concave surface in the center thereof and extending therethrough for receiving a top portion of the rear bicycle wheel therebetween, the side portions of said case positioned on both sides of the rear bicycle wheel and open to one another via an open inner portion positioned above the top portion of the rear bicycle wheel, the front portion and rear portion of said case angled upwardly and forwardly toward the front of the bicycle;

an elongated case lid hingedly mounted on the top of the open portion of said case, said case lid having a rear portion angled upwardly and forwardly toward the front of the bicycle;

a "U" shaped front mounting bracket attached to the front portion of said case, said front mounting bracket secured to the bicycle frame by a threaded bolt and nut attached to a mounting plate disposed adjacent the bicycle frame, the bolt received through an aperture in said bracket and said plate;

a pair of inclined, elongated mounting braces, one of said mounting braces positioned on one side of the rear wheel and having a horizontal upper end portion attached to one of said horizontal surfaces of the bottom portion adjacent to one of said side portions of said case and a lower end extending downwardly and bolted to one side of the rear wheel axle, and the other of said mounting braces positioned on the other side of the rear wheel and having a horizontal upper end portion attached to the other of said horizontal surfaces of the bottom portion adjacent to the other of said side portions of said case and a lower end extending downwardly and bolted to the other side of the rear wheel axle and;

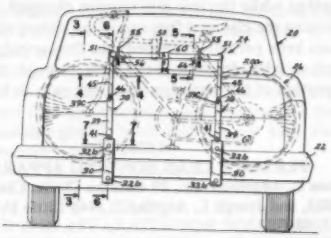
flange portions extending outwardly around the periphery of said case lid, said flange portions overlapping flange portions extending outwardly around the periphery of the open top portion of said case, said flange portions of said case lid disposed against the flange portions of said case when said case lid is disposed adjacent said case.

4,050,616

BUMPER-STYLE BICYCLE CARRYING APPARATUS

Larry B. Mosow, 5620 Wycliffe Road, Edina, Minn. 55436

Filed Sept. 19, 1975, Ser. No. 614,947
Int. Cl.[2] B60R 9/10
U.S. Cl. 224—42.03 B 8 Claims



1. A collapsible bicycle carrying rack for attachment to a bumper of a motor vehicle, comprising:

a. a pair of low-relief bumperette housing members suitable for attachment to a bumper of a motor vehicle, each of said housing members defining an internal cavity, said housing members having a length approximating that of the vertical dimension of a bumper, said housing members being substantially U-shaped in horizontal cross-section and having an open face for addressing the bumper, said open face being defined by edges which engage said bumper;

b. means for mounting said housing members to a bumper of a motor vehicle, in spaced apart relationship relative to one another; and

c. vertically telescoping support means mounted to said housing members for supportingly carrying a bicycle in elevated position above the bumper, said support means including a pair of vertical support standards positionable

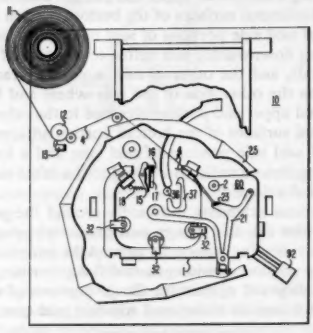
in an extended position telescopically projecting from said housing members, and positionable in a collapsed position for substantial encompassment within said cavities of said housing members, each of said vertical support standards cooperating with the respective housing member to provide vertically telescoping support means comprising at least three telescoping members.

4,050,617

METHOD AND APPARATUS FOR STUFFING RIBBONS

Donald William Biggs, Webster, and Wilson Parker Rayfield, Pittsford, both of N.Y., assignors to Burroughs Corporation, Detroit, Mich.

Filed Oct. 28, 1976, Ser. No. 736,629
Int. Cl.[2] G03B *1/58*
U.S. Cl. 226—1 **10 Claims**



8. A method of stuffing ribbon in a cartridge comprising providing the cartridge to be stuffed to a cartridge stuffing apparatus having a supply of ribbon with the free end of the ribbon clamped to the clamp position thereon;

causing a threader cam follower pin to be positioned against the ribbon and drawn through its path and into the cartridge while the free end remains clamped;

releasing the clamped free end of the ribbon after the ribbon has been partially threaded into the cartridge; and

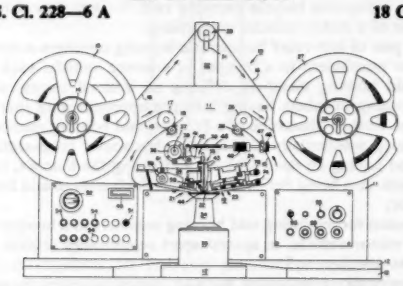
mechanically drawing the ribbon through the remaining portion of the cartridge along the path to be threaded.

4,050,618

FLEXIBLE LEAD BONDING APPARATUS

Thomas L. Angelucci, Sr., 89 Charlan Circle, Cherry Hill, N.J. 08003, and Joseph L. Angelucci, 1948 Little Drive, Deptford, N.J. 08096

Filed June 19, 1975, Ser. No. 588,289
Int. Cl.[2] H01L *21/60*
U.S. Cl. 228—6 A **18 Claims**



1. Apparatus for simultaneously bonding a plurality of electrical conductive flexible leads on a sprocketed lead frame tape to a rigid device comprising:

a support frame,

a tape supply reel rotateably mounted on said frame,

a sprocketed lead frame tape on said supply reel,

a first metering sprocket for pulling said lead frame tape from said supply reel.

a tape take-up reel rotatably mounted on said frame,

a second metering sprocket for paying out said lead frame tape to said take up reel,

said metering sprockets eliminating tension in said tape therebetween,

an index station intermediate said metering sprockets comprising a movable housing, having a tape transverse positioning guide for receiving said tape from said first metering sprocket, means for vertically positioning said lead frame tape, means for guiding said lead frame tape to said second metering sprocket and means for advancing said lead frame tape thereon.

said means for advancing said lead frame tape comprising an advancing tape means and a locking tape means,

a bonding station mounted on said support frame for bonding said flexible leads of said lead frame tape to said rigid device after said lead frame tape is advanced and positioned and locked in said indexing station by said advancing tape means and said locking tape means.

support means for said device, and,

means for vertically moving said indexing station independently of said tape reels between a position adjacent said support means and a position remote to said support means.

2. Apparatus for simultaneously bonding a plurality of electrical conductive flexible leads on a sprocketed lead frame tape to a rigid device comprising:

a support frame,

a tape supply reel mounted on said frame,

a sprocketed lead frame tape on said supply reel,

a first metering sprocket for pulling said lead frame tape from said supply reel,

a tape take-up reel rotatably mounted on said frame,

a second metering sprocket for paying out said lead frame tape to said take-up reel,

an index station intermediate said metering sprockets comprising a housing and means for advancing said lead frame tape.

said means for advancing said lead frame tape comprising an advancing tape means and a locking tape means, and

a bonding station mounted on said support frame for bonding said flexible leads of said lead frame tape to said rigid device after said lead frame tape is advanced and positioned and locked in said indexing station by said advancing tape means and said locking tape means,

said bonding station comprising a guide arm mounted on said support frame, a vertically movable bonding tool holder slidably mounted on said guide arm, lever actuating means pivotably mounted on said support frame, said lever actuating means comprising a cam follower engaging a drive cam and spring means for urging said cam follower into engagement with said drive cam, and a load cell connected to said spring means for indicating the spring force being applied to said vertically movable bonding tool holder during a bonding operation of said flexible leads to said rigid device.

3. Apparatus for simultaneously bonding a plurality of electrical conductive flexible leads on a sprocketed lead frame tape to a rigid device comprising:

a support frame,

a tape supply reel mounted on said frame,

a sprocketed lead frame tape on said supply reel,

a first metering sprocket for pulling said lead frame tape from said supply reel,

a tape take-up reel rotatably mounted on said frame,

a second metering sprocket for paying out said lead frame tape to said take-up reel,

an index station intermediate said metering sprockets comprising a housing and means for advancing said lead frame tape,

said means for advancing said lead frame tape comprising an advancing tape means and a locking tape means, and

a bonding station mounted on said support frame for bonding said flexible leads of said lead frame tape to said rigid device after said lead frame tape is advanced and positioned and locked in said indexing station by said advancing tape means and said locking tape means,

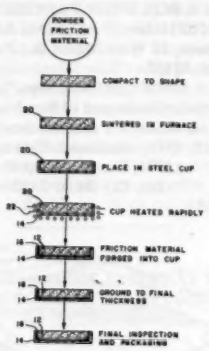
said index station further includes a tape guide shoe supported by said housing and having a contact surface thereon for engaging said lead frame tape at said flexible leads, and vacuum manifold means in said tape guide shoe for urging said flexible leads into a common horizontal plane parallel to the surface of said rigid device.

4,050,619

METHOD OF ATTACHING A FRICTION LINING TO A REINFORCING CUP

Walter R. Tarr, Green Island, N.Y., assignor to The Bendix Corporation, South Bend, Ind.

Filed May 4, 1976, Ser. No. 683,116
Int. Cl.² B23K *19/00*
U.S. Cl. 228—162 **6 Claims**



3. A method of manufacturing a brake pad assembly comprising the steps of:

placing a powder mixture of friction composition in a die;

compacting the powder mixture to form a preformed friction material;

conveying said preformed material through a furnace having a predetermined temperature to sinter said powder mixture;

removing said sintered preformed friction material from said furnace;

placing said sintered preformed friction material in a reinforcing cup;

rapidly heating said reinforcing cup to a predetermined temperature;

transferring the heated cup and sintered friction material to a press before significant thermal conduction takes place between said heated cup and said sintered friction material and

striking said sintered friction material and said heated cup with a single compressive blow to provide said friction material with a predetermined density and to establish a weld along the entire interface of said friction material and said retainer cup to produce said brake lining assembly.

4,050,620

METHOD OF WELDING A FRICTION MATERIAL TO A REINFORCING MEMBER

John P. Kwolek; William G. Urso, and Trevor D. Jones, all of Latham, N.Y., assignors to The Bendix Corporation, South Bend, Ind.

Filed May 4, 1976, Ser. No. 683,460
Int. Cl.² B23K *19/00*
U.S. Cl. 228—162 **6 Claims**

4. A method of manufacturing a brake pad comprising the steps of:

filling a mold with a copper base friction material;

densifying the copper base friction material in said mold;

placing the densified copper base friction material in a furnace;

raising the temperature in the furnace to sinter said copper base friction material;

removing the sintered copper base friction material from said furnace;

placing the sintered copper base friction material on a retainer;

heating said sintered copper base friction material and retainer until a uniform temperature between 1400° to 1900° F is reached; and

striking said heated retainer and sintered copper base friction material with a single compressive force to compact said copper base friction material to a predetermined density and to metallurgically bond said copper base friction material to said retainer.

4,050,621

METHOD AND APPARATUS FOR SOLDERING ELECTRIC TERMINALS TO DOUBLE-SIDED CIRCUIT BOARDS

Jean Claude Bouley, Dole, France, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

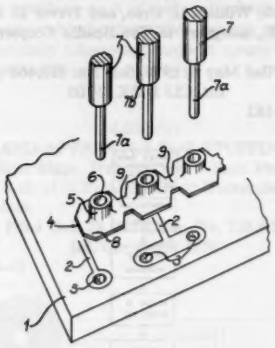
Filed Nov. 3, 1976, Ser. No. 738,220
Int. Cl.² B23K *1/02*; H05K *3/34*
U.S. Cl. 228—180 R **4 Claims**

1. A method for soldering elongate conductors perpendicular to a circuit board, comprising the steps of:

providing an elongate strip of fusable solder material comprising a plurality of interconnected sections each comprising a substantially flat base portion and a central portion protruding from one face of the base portion, each of said central portions defining a central opening through the base portion to receive an elongate conductor to be soldered to said board, and said base portions of adjacent sections being joined by neck portions of the solder material, said neck portions being narrower than said base portions;

placing said strip on a circuit board with said elongate con-

ductors passing through said openings in the strip at selected locations relative to the board; and



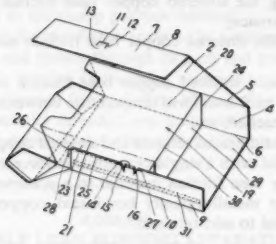
fusing said strip to sever said neck portions by surface tension of the fused solder material and to form each said section into a discrete meniscus about the conductor passing through said opening.

4,050,622

DRAWER-AND-SHELL TYPE CONTAINER WITH DRAWER STOP

Katsuji Shimada, 13-46-203, 2-chome, Nigawakita, and Katsuyuki Shimada, 13-46-203, 2-chome, Nigawakita, both of Takarazuka, Hyogo, Japan

Filed Aug. 31, 1976, Ser. No. 719,385
Claims priority, application Japan, Jan. 12, 1976, 51-2994
Int. Cl.² B65D 5/38
U.S. Cl. 229—19 **2 Claims**



1. A device for preventing a push-up drawer in an outer container from slipping out of the top or bottom of the container, said device comprising:

a drawer having a longitudinal slit through one side thereof, said slit being inclined at an angle with respect to the edges of said side and having an angled portion at the forward end of said slit; and

a shell folded around said drawer, the side of said shell, opposite the side of said drawer having said slit therethrough, having a tongue-shaped inserting piece cut therein and inserted into said longitudinal slit.

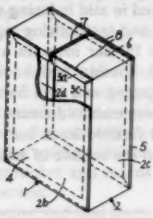
4,050,623

CONTAINING BOX FOR VARIOUS PRODUCTS

Giorgio Vacchi, Via G. Marconi, 7, Bologna, Italy

Filed June 25, 1976, Ser. No. 699,768
Int. Cl.² B65D 5/16, 5/32
U.S. Cl. 229—23 R **3 Claims**

1. A containing box for various products comprising a strip of sheet material folded so as to form a peripherical rectangular element with a top wall, a bottom wall and side walls connecting said top and bottom walls, said peripherical element defining two opposite open faces and peripherical ribs circumscribing said open faces and folded towards the inside of the peripherical element and perpendicularly thereto, a pair of flaps having the same shape of said rectangular element and whose margins are jointed to said ribs thus determining closing of the open faces of the element, wherein according to the improvement the opposite ends of said strip abut each other to form a slit transversally crossing the top wall of said element and said closing flaps have their borders laterally defining said top wall connected together by a panel covering said top wall, a tearing portion being further provided in said top wall and in said covering panel adjacent to said slit and defined by perforation lines.

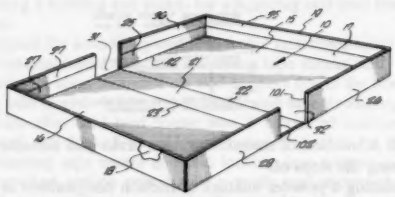


4,050,624

ONE-PIECE BOX WITH TAPERED SIDES AND METHOD OF MAKING SAME

Donald F. Williams, 15 West Mason St., P.O. Box 1527, Santa Barbara, Calif. 93102

Continuation of Ser. No. 287,045, Sept. 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 241,320, April 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 163,789, July 19, 1971, abandoned. This application Nov. 29, 1974, Ser. No. 528,448
Int. Cl.² B65D 5/22
U.S. Cl. 229—33 **11 Claims**



1. A one-piece folded box comprising a receptacle section having a bottom panel, a pair of spaced side flaps, a front flap and fold lines at the point of connection of said side flaps and front flap to said bottom panel; means fixing said front flap to said side flaps in folded and joined configuration at their mutual corners; a cover section having a lid panel, a pair of spaced side flaps, a front flap and fold lines at the point of connection of said side flaps and said front flap to said lid panel; means fixing said front flap and said side flaps in folded and joined configuration at their mutual corners; said side flaps of both said receptacle section and said cover section having a free edge opposite their respective fold lines; a hinge section including a hinge wall containing a pair of spaced fold lines each defining an active hinge, said hinge section connecting the receptacle and cover sections at said active hinges; means for reducing contact at closure between the cover and the receptacle side flaps to relieve that contact pressure resistance against maintaining proper closure of said cover section with respect to said receptacle section, said last-named means comprising

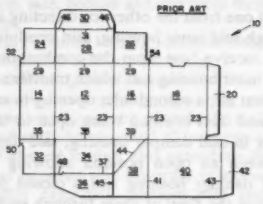
receptacle side flaps having a substantial portion of the depth between said free edge thereof and the respective fold lines of the receptacle section less than the between the fold lines of said hinge section; and means for arresting the closing cover short of enveloping the front flap of the receptacle section, said means for arresting comprising a hinge section having a greater depth than either of the front flaps, and at least one stop tab having a fold line connected to any one of said flaps, said bottom panel and said lid panel.

4,050,625

CARTON END CLOSURE AND REINFORCING CONSTRUCTION

Clifford Brant Rice, East Windsor, and David Paul Mastroianni, Ellington, both of Conn., assignors to Rice Packaging Inc., Ellington, Conn.

Filed Dec. 16, 1976, Ser. No. 751,466
Int. Cl.[2] B65D *5/06*
U.S. Cl. 229—38 **2 Claims**



1. In a carton of the type comprising spaced front, rear and side panels, wherein a supplemental reinforcing panel is disposed within the carton immediately rearwardly of the front panel, with the supplemental reinforcing panel being hingedly connected to a first bottom dust flap which is hinged to one of the side panels, and a second bottom dust flap is hinged to the other of the side panels, and a bottom panel is hinged to the rear panel, the improvement which comprises, locking shoulders on the bottom dust panels and locking slots on the bottom panel, the locking shoulders being engageable with the locking slots for providing a double interlock on carton erection.

4,050,626

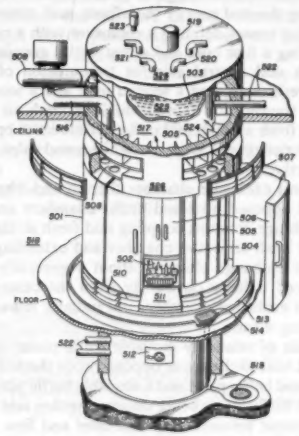
SUPPLEMENTAL HEAT AND HEAT TRANSFER SUBSYSTEMS FOR SOLAR AIR CONDITIONING SYSTEMS

Thomas Y. Awalt, Jr., 804 Poinciana Drive, Gulf Breeze, Fla. 32561

Filed Apr. 18, 1975, Ser. No. 569,556
Int. Cl.[2] F24D *3/00*; F24J *3/02*
U.S. Cl. 237—1 A **21 Claims**

1. A heating unit for space ambiant to said unit and for liquid medium heat storage comprising:

1. a combustion area;
2. a liquid circulating space providing circulation access to a first and second direct heat transfer means;
3. means proximate to said combustion area for a first direct transfer of heat of combustion from the area of combustion to the liquid medium in said circulating space;
4. Variably adjustable insulation shielding means for providing and controlling a second direct radiant heat transfer between the liquid medium within said circulating space and the ambiant space.
5. means proximate to the combustion area for a third direct heat transfer of heat of combustion to the ambiant space including radiant heat of combustion;
6. positive means, independent of combustion control, first heat transfer control and third heat transfer control and notwithstanding any inherent variable affect on amounts of heat in storage by the weather for substantially variably adjusting the amount of heat transferred by way of the second heat transfer whereby heat in excess of the comfort requirements of the living space may be conserved under variable conditions of weather and varying amounts of heat in storage without substantially diminishing the combustion potential for heat generation, the transfer potential for first direct heat transfer and the transfer potential for the third direct heat transfer.
7. feed and return means whereby liquid medium may be returned from the liquid circulating space to heat storage and fed from heat storage to the liquid circulating space;
8. circulation means within said circulating space whereby the liquid medium may circulate between the first and second direct heat transfer means, whereby the temperature of space ambiant to the unit may be regulated, to the extent permitted by the potential of the second direct heat transfer and the heat in storage, in the presence of and in the absence of combustion in the combustion area, and without substantially dimmishing the heat generating and storage potential of the first direct heat transfer, employing the liquid heat storage medium at varying temperatures by variably adjusting heat transfer between the liquid heat storage medium and the living space.

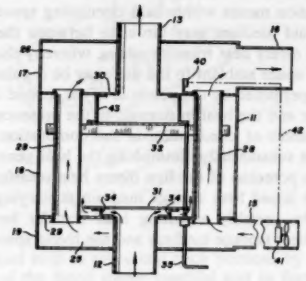


18. The method of heating a living space from a controlled heat source and storage of heat in liquid storage comprising the steps of intermittently heating a liquid in a first direct heat transfer from the controlled heat source to the liquid, heating the living space as required for comfort and conservation during heating of the liquid and during intervals in heating of the liquid by way of said first direct heat transfer in a second direct heat transfer between said liquid and said living space, and a third direct heat transfer between said heat source and said living space, said second heat transfer being controlled by an insulation shield which is substantially variably and independently of but coordinated with control of said controlled heat source, said third heat transfer, and variations in the amount of heat in said liquid storage, circulating the heated liquid during the first direct heat transfer to liquid storage to thereby store heat and, in the absence of first direct heat transfer, circulating the heated liquid from storage to the site of the first direct heat transfer for controlled heating of the living space as required through direct heat transfer.

4,050,627
ADJUSTABLE HEAT RECOVERY SYSTEM FOR FLUE STACKS

Joseph E. Mayer, Minnetonka, Minn., assignor to Kimball of Minnesota, Inc., Minneapolis, Minn.

Filed Aug. 20, 1976, Ser. No. 716,186
Int. Cl.[2] F24B 7/04
U.S. Cl. 237—55 4 Claims



1. Heat exchange means for use in combination with flue means conducted heated gases from a combustion zone and for extracting thermal energy therefrom; said means comprising:

a. casing means defining a enclosure with a central axis and having a first inlet and a first outlet generally concentric with said central axis for transmission of hot flue gas therethrough, and a second inlet and a second outlet for the transmission therethrough of fresh air to be heated, and fresh air inlet and outlet chambers at opposed ends of said casing and adjacent said second inlet and outlet respectively;

b. a heat exchange chamber therein and disposed between said opposed inlet and outlet chambers and having heat exchange conduits coupling said fresh air inlet chamber to said fresh air outlet chamber and extending through said heat exchange chamber about a generally annular zone spaced radially outwardly from the central axis of said heat exchange chamber, and radially inwardly from said casing means;

c. a pair of relatively movable baffle plates disposed within said heat exchange at opposed ends thereof and including a fixed baffle plate and a movable baffle plate with each of said baffle plates being disposed within said heat exchange chamber between said first inlet and first outlet and extending radially outwardly from said central axis to said annular zone for controlling the flow of hot flue gas out said heat exchange conduits, and radially outwardly of said annular zone;

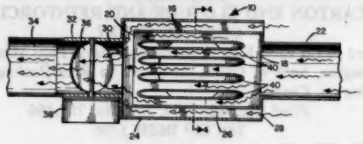
d. baffle adjustment means for controllably positioning said movable baffle plate axially within said heat exchange chamber to define the axial length of said heat exchange conduits exposed to said heated flue gas between said heat exchange chamber inlet and said movable baffle.

4,050,628
HEAT RECLAIMER

Andrew Konnerth, III, 9 Little Harbor Road, Woods Hole, Mass. 02543

Filed Jan. 28, 1977, Ser. No. 763,324
Int. Cl.[2] F24B 7/04
U.S. Cl. 237—55 4 Claims

1. Apparatus for reclaiming heat from and for controlling the flow of combustion gases passing through a flue from a heater to an exhaust stack, comprising: an inner housing having first inlet and outlet openings, said first inlet opening being adapted for connection to one section of said flue leading from said heater, whereby combustion gases from said heater will enter said inner housing through said first inlet opening and will exit from said inner housing through said first outlet opening; an outer housing at least partially surrounding said inner housing, said inner and outer housings being spaced one from the other to define an intermediate chamber therebetween which is in communication with said first outlet opening, a second outlet opening in said outer housing, said second outlet opening being in substantial alignment with said first outlet opening and being in communication with a damper housing which is in turn adapted for connection to another section of the flue leading to the exhaust stack; a plurality of conduit

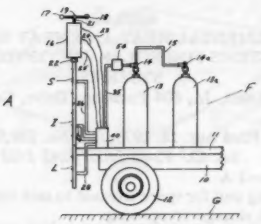


means spaced one from the other for directing a flow of ambient air through said inner housing, said conduit means having walls which receive heat from the combustion gases passing through said inner housing and which transfer said heat to said flow of ambient air; a second inlet opening in said outer housing, said second inlet opening being open to the ambient air; and a damper in said damper housing, said damper being adjustable between an open position allowing gases to flow through said damper housing and a closed position significantly retarding the flow of gases through said damper housing.

4,050,629
FLUID DISPERSION METHOD AND APPARATUS

Grady W. Query, 1725 Matthews Mint Hill Road, Matthews, N.C. 28105, and O. Grady Query, 768 Wakendaw Blvd., Mount Pleasant, S.C. 29464

Filed June 25, 1975, Ser. No. 590,219
Int. Cl.[2] A01C 23/00; B05B 17/04
U.S. Cl. 239—11 20 Claims



1. A method for dispersing a fluid in an area comprising:

a. determining the wind velocity of said area;

b. signalling through switching means, dependent on said wind velocity, to a plurality of solenoids;

c. distributing said fluid in said area through a plurality of valves controlled by said plurality of solenoids;

d. dispersing said fluid through a plurality of nozzles of a plurality of predetermined sizes; which are operatively associated with said plurality of valves;

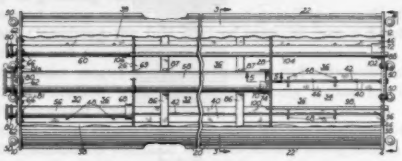
e. arranging said plurality of nozzles into a plurality of nozzle assemblies, each of said plurality of nozzles being of a selected size; and

f. switching said plurality of valves in order to open said plurality of valves selectively for introducing a selected quantity of fluid into said area, which is proportional with said wind velocity.

4,050,630
COMPOSITE ELONGATED STEAM CHAMBER

Joseph H. Dupasquier, 5855 NW. Skyline Drive, West Linn, Oreg. 97068

Filed Aug. 1, 1975, Ser. No. 601,188
Int. Cl.[2] F26B *21/12;* D21F *5/18;* B05B *1/28*
U.S. Cl. 239—121 3 Claims



1. A composite elongated steam chamber arranged to be mounted crosswise over a traveling wet mat and arranged to discharge steam down on the mat, comprising

a. elongated top, side, bottom and end walls forming a steam compartment,

b. a steam supply conduit leading into said compartment for directing steam into said compartment,

c. and means delivering steam to said conduit,

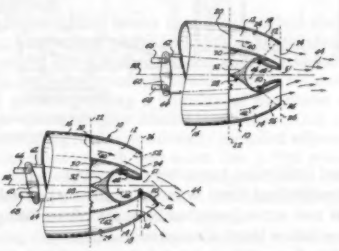
d. said bottom wall comprising upwardly and inwardly extending portions from each of said side walls extending the length of said chamber and at least one parallel substantially V-shaped trough also extending the length of said chamber between said inwardly extending portions,

e. said inwardly extending portions and said V-shaped trough having adjacent upper terminal ends spaced a slight distance apart to form steam discharging slots extending the length of said chamber, said terminal ends being extended in opposite directions away from said slots and being rounded at said slots for providing rigidity to said inwardly extending portions and to said trough at said discharging slots and also providing quiet and low friction passage of steam therethrough.

4,050,631
JET ENGINE NOZZLE FOR CONTROLLING THE DIRECTION OF THRUST

Bjarne Elroy Syltebo, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 26, 1976, Ser. No. 670,633
Int. Cl.[2] B64C *15/06;* F02K *1/20*
U.S. Cl. 239—265.25 17 Claims



1. A jet nozzle for use with a jet propulsion engine for controlling the direction of the fluid discharged therefrom relative to a reference line extending rearwardly from said jet nozzle comprising:

outer housing means defining a fluid flow duct for rearwardly directing the fluid discharged by said jet engine, said outer housing means having an entrance orifice and an exit orifice;

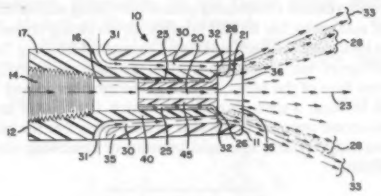
bifurcation means mounted within said fluid flow duct for dividing said fluid flowing through said duct into first and second thrust producing fluid streams, said bifurcation means dividing said exit orifice into first and second spaced apart discharge orifices for respectively discharging said first and second fluid streams in a rearward direction, said bifurcation means defining a rearwardly opening cavity between said first and second discharge orifices, said duct in said housing means and said bifurcation means being so constructed and associated with one another to discharge said first and second fluid streams inwardly toward said reference line for impingement of said inwardly directed first and second fluid streams on each other at a location rearward of said discharge orifices, the interaction between said impinging first and second fluid streams re-directing said first and second fluid streams as a single rearwardly directed fluid stream that is substantially symmetrical about said reference line; and

deflection means operable in a thrust vectoring mode of operation for angularly disposing said single thrust producing fluid stream relative to said rearwardly extending reference line, said deflection means operable from a stowed position within said rearwardly opening cavity of said bifurcation means to at least one deployed position wherein said deflection means extends into and intercepts at least one of said first and second fluid streams, each of said deployed position of said thrust vectoring mode redirecting the intercepted first and second fluid streams outwardly and away from said reference line for mergence with one another at a position rearward of said discharge orifices and outward of said reference line to form a single thrust producing fluid stream angularly disposed relative to said reference line.

4,050,632
LOW NOISE AIR NOZZLE

Harold G. Wyse, Dayton, Ohio, assignor to Gad-Jets, Inc., Dayton, Ohio

Filed Sept. 15, 1976, Ser. No. 723,435
Int. Cl.[2] B05B *1/34*
U.S. Cl. 239—425 6 Claims



1. An air nozzle comprising:

a. a body,

b. means on said body for receiving a supply of compressed air,

c. means forming a central orifice having a discharge opening through said body on one side thereof and connecting to said compressed air receiving means for discharging a stream of compressed air through said central orifice opening,

d. means forming at least one secondary orifice having a discharge opening through said one side of said body adjacent to and surrounding said central orifice opening, said secondary orifice also connecting to said compressed air receiving means, and said secondary orifice opening being shaped to discharge compressed air therefrom in an outwardly expanding or diverging annular cone surrounding the stream of air from said central orifice,

e. means forming at least one tertiary air passage through said body, said tertiary air passage having an outlet through said one side of said body adjacent to and surrounding said secondary orifice discharge opening, and an inlet on the exterior of said body on another portion

thereof removed from said central, secondary, and tertiary discharge and outlet openings, and

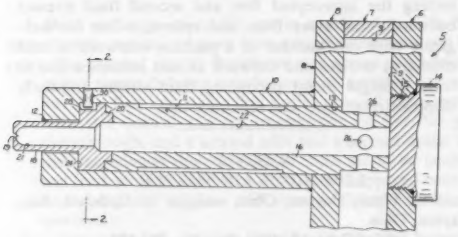
f. a shroud surrounding said central, secondary, and tertiary discharge and outlet openings and extending a predetermined distance outwardly therefrom to define a shroud outlet, said secondary discharge opening inducing a forward flow of low pressure air through said tertiary air passage from its inlet to its outlet as compressed air is discharged through said primary and secondary discharge openings, said flow of low pressure air accompanying and surrounding said compressed air discharges when said shroud outlet is not blocked, and said compressed air escaping from said nozzle by causing a reverse air flow through said tertiary air passage when said shroud outlet is blocked.

4,050,633

SPRAY BARS FOR METAL ROLLING

Richard B. Courson, Grosse Pointe Park, Mich., assignor to Almo Manifold & Tool Company, Center Line, Mich.

Filed Sept. 27, 1976, Ser. No. 726,985
Int. Cl.² B05B *1/14*
U.S. Cl. 239—550 **10 Claims**



1. Improvement in a spray bar for metal rolling having a layered body and a plurality of spray nozzles carried thereon, said improvement comprising means providing access from the rear of said spray bar to said nozzles for servicing thereof, said means including for each nozzle an elongated housing fastened on said spray bar so that the former projects outwardly from the front face of the latter, an elongated member joined to said nozzle to form a cartridge nozzle which fits in said housing, and an access opening in the rear of said spray bar for inserting said cartridge nozzle into said housing or removing the same therefrom.

4,050,634

FIN TUBE DISTRIBUTION NOZZLE

John L. Sylvester, Santa Rosa, Calif., assignor to Ecodyne Corporation, Lincolnshire, Ill.

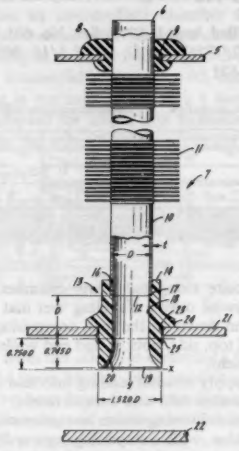
Filed May 20, 1976, Ser. No. 688,504
Int. Cl.² A62C *31/02*
U.S. Cl. 239—601 **7 Claims**

1. An open ended nozzle for dispersing an umbrella-like spray from a thin film of liquid water flowing by gravity down a tube without creating sufficient back pressure to destroy such thin film, such tube having a predetermined wall thickness and an outside diameter sized to enable such tube to be received in an entrance opening at the upper end of said nozzle means for positioning said terminal end in said nozzle, the inner diameter of said nozzle being identical to the inner diameter of such tube for a distance equal to said tube outer diameter beginning at said terminal end, and the inner surface of the remainder of the cross sectional shape of said nozzle being defined by the following equation for an axial distance equal to 0.745 times said tube outer diameter:

$$x = \pm 0.875D - t - 0.5y - \sqrt{0.75Dy},$$

where

D = said outside diameter of such tube,
t = said wall thickness of such tube,



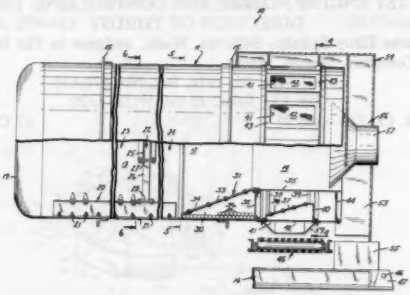
with the y axis being the longitudinal center line of said nozzle, and the *x* axis being located a distance equal to 1.750D from said tube terminal end, and the limits of the *x* axis being equal to the distance 1.520D centered on the *y* axis.

4,050,635

METHOD AND APPARATUS FOR RECLAIMING SAND

Edward E. Mueller, Tonka Bay; Thomas H. Painter, Bloomington, and Michael K. Harrod, St. Paul, all of Minn., assignors to Whirl-Air-Flow Corporation, Minneapolis, Minn.

Filed Aug. 19, 1976, Ser. No. 715,911
Int. Cl.² B02C *23/16*
U.S. Cl. 241—24 **8 Claims**



1. Sand reclaiming apparatus comprising:

a. a longitudinal drum defining an internal chamber having first and second subchambers, said drum being mounted for rotation about a longitudinal axis;

b. means for rotating said drum;

c. inlet means communicating with said first subchamber;

d. a plurality of rib members located within said first subchamber and attached to the interior periphery of said drum, said rib members being spaced circumferentially therein and extending longitudinally of said drum;

e. partition means located within said first subchamber for dividing said first subchamber into first and second breaking zones, said partition means being constructed to permit only the passage of particles having a predetermined first maximum size therethrough;

f. a plurality of projection members attached to each of said

rib members within said first breaking zone, said projection members extending inwardly within said drum;

g. first sizing means adjacent said second breaking zone for classifying material into a first part consisting of particles having a predetermined second maximum size and a second part consisting of oversized particles, said first sizing means in part defining a grinding zone containing a plurality of grinding balls;

h. second sizing means adjacent said grinding zone for further classifying the first part of material into a finished project and oversized particles;

i. first outlet means located in said second subchamber in communication with said second sizing means for discharging said finished product; and

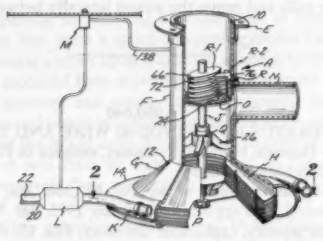
j. second outlet means located in said second subchamber in communication with said first and second sizing means for discharging said oversized particles.

4,050,636

ENERGY SAVING GARBAGE DISPOSAL UNIT

Clarence R. Possell, 4842 Viane Way, San Diego, Calif. 92110, and Robert J. Winkler, 2101 E. 4th St. No. 150, Santa Ana, Calif. 92704

Filed Mar. 29, 1977, Ser. No. 782,368
Int. Cl.² B02C *18/42*
U.S. Cl. 241—46 B **12 Claims**



1. A garbage disposal unit of the type that includes a cylindrical shell that has upper and lower ends and is disposed in a substantially vertical position below a drain opening in a sink and said upper end in communication with said drain opening, said shell having a masticated garbage outlet intermediate said upper and lower ends that is in communication with a waste line, said garbage disposal unit being characterized by being driven by pressurized water from a source thereof adjacent said unit including:

a. garbage masticating means in said cylindrical shell, said garbage masticating means including a first bladed rotatable portion and a second bladed stationary portion secured to the interior surface of said cylindrical shell, said second portion defining a plurality of transverse spaces through which said first bladed rotatable portion rotates, said masticating means positionally mounted adjacent and in communication with said waste line, a first portion of said garbage being masticated, passing from said masticating means and a second portion of said masticated garbage passing below said mastication means;

b. a housing displaced below said shell and in communication with said lower end thereof, said housing defining a circular confined space;

c. a plurality of axially aligned turbine discs rotatably supported in said circular confined space below said masticating means, said discs being frusto-conical in contour having at least one set of axially aligned openings formed therethrough, aid frusto-conical contour defining an upward flow direction of water subsequent to said water interfacing with said turbine discs, said discs defining a plurality of radially extending spaces therebetween of sufficiently narrow width as to impose substantial drag on a stream of pressurized water flowing therethrough;

d. first means in communication with said source of pressurized water being coupled to said housing for providing at least one high velocity jet of water inside said housing that impinges on said turbine blades at an angle to subsequently flow through said radially extending spaces at a reduced velocity and an increased pressure to impart rotational energy to said turbine blades prior to exiting from said turbine blades through said axially aligned openings defined thereby, with said water after exiting through said opening flowing upwardly in said shell to said garbage masticating means to flush masticated garbage outwardly through said discharge opening, said exiting water to contact said first and second portions of said garbage for removal into said waste lines;

e. second means for transferring the rotational energy of said turbine blades to said first rotatable portion of said masticating means;

f. third means in said shell for preventing garbage that has not been masticated from moving downwardly in said shell substantially below said masticating means; and,

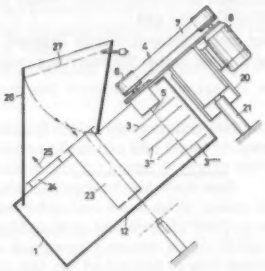
g. fourth means operatively associated with said first means and manually operable to control the flow of water from said pressurized source of water to said circular confined space in said housing, said fourth means including a first valve in communication with said pressurized water, said housing and a second normally closed valve, said second valve being manually operable to control flow from said source through said first valve and into said housing.

4,050,637

PULVERIZING APPARATUS WITH A TOOTHED DISC

Wilhelm Eirich, Bahnhofstr. 19, and Gustav Eirich, Walldurnerstr. 41, both of Hardheim, Germany

Filed Jan. 21, 1976, Ser. No. 650,904
Claims priority, application Germany, Jan. 29, 1975, 2503621
Int. Cl.² B02C *23/24*
U.S. Cl. 241—56 **16 Claims**

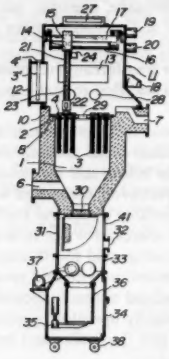


1. An apparatus for pulverizing elastic, viscous and bulky materials, refuse and other waste materials, comprising a high-speed driven container having at least one eccentrically disposed high-speed tool, said tool having a shaft disposed approximately parallel with the axis of the container and provided with a plurality of spaced apart toothed discs the plane of each disc being transverse to the tool shaft and which partially dips into the material present at the container wall, and in that the high-speed tool is radially displaceable in the container and rotates in a direction opposite to that of the adjacent container wall.

4,050,638
RADIOACTIVE MATTER CONTAINING WASTE GAS TREATING INSTALLATION

Isao Ito, Nagoya, and Yoichi Karita, Handa, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Apr. 21, 1975, Ser. No. 570,079
Claims priority, application Japan, Apr. 24, 1974, 49-45926; May 8, 1974, 49-51738; May 8, 1974, 49-50809
Int. Cl.[2] G21C *19/14*
U.S. Cl. 241—222 11 Claims



1. A radioactive matter containing waste gas treating installation comprising, in combination:

A. a ceramic filter element exchange device including;
   1. an air-tight box means with a filter element supplying box having a sight glass
   2. a traveling crane means driven by a driving shaft means arranged in the upper part of the box means, and
   3. a lifting means carried by the frame means for suspending a chuck for holding a filter element and raising and lowering said element, to exchange it for a new element and;

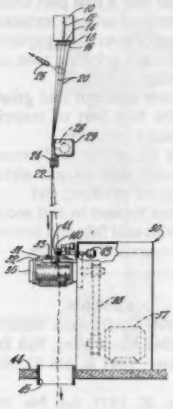
B. a spent ceramic filter treatment system including;
   1. a spent ceramic filter receiving chamber having an upper dimension with a bottom plate, said bottom plate openable and closeable in an air-tight manner
   2. a crusher chamber, the top of which is defined by said bottom plate and including crusher means for pulverizing said filter element and,
   3. a container means located closely adjacent to the bottom of the crusher means for receiving crushed pieces.

4,050,639
METHOD AND APPARATUS FOR ADVANCING STRAND

Robert R. Jackson, Aiken, S.C., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 5, 1976, Ser. No. 646,740
Int. Cl.[2] B65H *54/02, 54/86*
U.S. Cl. 242—18 G 8 Claims

1. In an apparatus for advancing continuous glass strand wherein a winder collects the strand into a wound package, wherein a pair of rotatable rolls cooperate to advance the strand therebetween during times the strand is not collected on the winder and wherein at least one of the rolls is rotatably driven, the improvement comprising:

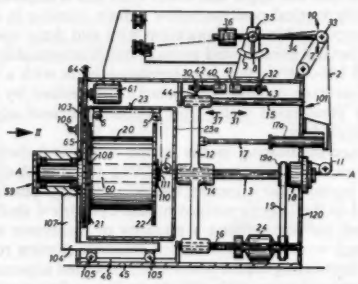


a plurality of helical teeth extending outwardly from each of the rolls adapted to concurrently advance the strand from the rolls and move the strand laterally between the rolls.

4,050,640
APPARATUS FOR WINDING WIRE AND THE LIKE

Werner Henrich, Horbach, Germany, assignor to Firma Henrich KG, Horbach, Germany

Continuation-in-part of Ser. No. 432,360, Jan. 10, 1974, abandoned. This application Aug. 26, 1975, Ser. No. 608,001
Claims priority, application Germany, Jan. 13, 1973, 2301594
Int. Cl.[2] B65H *54/02*
U.S. Cl. 242—25 R 3 Claims



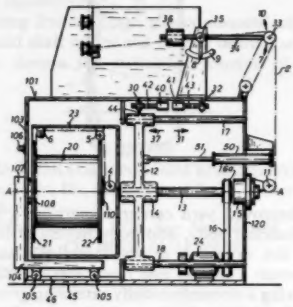
1. An apparatus for winding at a high speed a strand, such as wire, cable, rope and the like, upon a spool comprising means for fixedly supporting thereon a spool upon which a strand is to be wound, a rotatably mounted flyer movable around the spool to wind the strand thereon, said flyer comprising a cylindrical frame having a closed end and enclosing the spool and having roller means within the frame on the inner face thereof for guiding the strand entering the flyer at its rotary axis to the spool such that outward movement of the strand within the rotating flyer is limited by the inner face of the frame, means for rotating said flyer around said spool in a direction, said roller means comprising at least one guide roll rotatably mounted on said flyer to guide the strand during winding, and fan blades on said guide roller whereby air currents created by the rotation of the flyer cause the fan blades to rotate the roller.

4,050,641

APPARATUS FOR WINDING WIRE

Werner Henrich, Horbach, Germany, assignor to Firma Henrich KG, Horbach, Germany

Continuation-in-part of Ser. No. 427,327, Dec. 21, 1973, abandoned. This application Sept. 4, 1975, Ser. No. 610,408
Claims priority, application Germany, Dec. 22, 1972, 2262844
Int. Cl.[2] B65H 75/00
U.S. Cl. 242—47 6 Claims



1. An apparatus for winding a strand, such as wire, cable, rope and the like, upon a spool comprising means for fixedly securing thereon a spool upon which the strand is to be wound, a rotatably mounted flyer movable around the spool to wind the strand thereon, and means for reciprocating said flyer between two end points in a direction parallel to the axis of the spool to wind the strand upon the spool and to control the axial movement of said flyer to wind the strand on the spool in uniform layers, said flyer comprising a cylindrical frame having a closed end and enclosing the spool at one of said end points, a hollow rotatable shaft attached to said frame closed end and the strand entering the closed end of said frame at the rotary axis to the spool through said hollow shaft, a plurality of rollers within the frame on the inner face thereof for guiding the strand entering the flyer such that outward movement of the strand within the rotating flyer resulting from centrifugal force is limited by the inner face of said frame whereby breaking of the strand is prevented and the strand is enclosed within said hollow shaft and frame during winding on the spool.

4,050,642

WINDING OR REWINDING FILM

Takuma Katsumata, Inazawa; Koji Kato, Aichi; Hisao Kishigami, Toki, and Noriyasu Kuroda, Nagoya, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

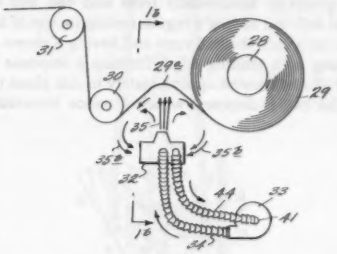
Filed Oct. 8, 1975, Ser. No. 620,916
Claims priority, application Japan, Nov. 13, 1974, 49-130616
Int. Cl.[2] B65H 75/02, 23/16
U.S. Cl. 242—55 1 Claim

1. Apparatus for winding or rewinding a film comprising:

a spool;

a roll positioned adjacent said spool for guiding film being wound or rewound on the spool;

means for directing pressurized air against a surface of the film located between said spool and the guide roll and for collecting said air by suction on the same side of the film as said surface, said means including at least one nozzle formed to direct onto said film surface, and beyond the



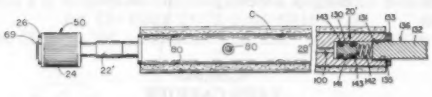
edges thereof, a jet of air which is elongated transversely of the length of said film.

4,050,643

EXPANDABLE CORE-SHAFTS

Arthur D. Secor, Luna Pier, Mich., assignor to Great Lakes Industries, Inc., Toledo, Ohio

Filed May 15, 1975, Ser. No. 577,777
Int. Cl.[2] B65H 75/24
U.S. Cl. 242—72 R 18 Claims



1. A self-contained hydraulically expandable core-shaft having a closed fluid system comprising:

A. a shaft having a longitudinal manifold duct therein with a chamber at one end thereof and a plurality of radially extending ducts therealong,

B. a piston in said chamber to form a master cylinder,

C. a substantially stable liquid in said cylinder and said ducts,

D. separate rams at the outer ends of said radially extending ducts for projecting outwardly from the circumference of said shaft to grip the inside of a core surrounding said shaft,

E. separate diaphragm means in said radially extending ducts between the inner ends of each of said rams and said liquid in said radial ducts, whereby leakage of said liquid is prevented around said plungers regardless of the liquid pressure and variations in torque on said shaft by said core,

F. mechanical means for operating said piston in said master cylinder to pressurize said liquid to operate said rams,

G. resilient means for normally urging said rams inwardly of the circumference of said shaft, and

H. contractable and expandable means connected to said manifold ducts in said shaft for limiting and maintaining an upper maximum pressure up to about 1000 psi in said system that can be applied to said diaphragms.

4,050,644

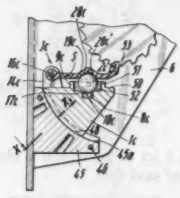
INERTIA RESPONSIVE CONTROL DEVICE

Artur Fohl, Schelmenwasenstr. 68, 7061 Haubersbronn, Germany

Filed Jan. 20, 1975, Ser. No. 542,381
Claims priority, application Germany, Jan. 22, 1974, 2402921
Int. Cl.[2] A62B 35/02; B65H 75/48
U.S. Cl. 242—107.4 A 19 Claims

1. An inertia operated control device, especially for use in a vehicle for effecting locking of a vehicle safety belt when the vehicle acceleration exceeds a predetermined limit, said device

comprising in combination: an inertia element in the form of a ball movable toward several sides from stable rest positioning thereof, a control element pivotally supported at a point spaced generally horizontally from said ball and extending over said ball and having a region resting on top of said ball, a member on which the ball rests and having a recess including an opening with limiting edges forming a response threshold for the ball and located approximately in one plane relative to which the ball is disposed which distance between opposite



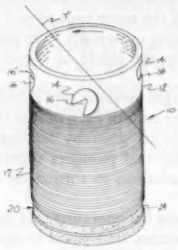
limiting edges of the opening is less than the radius of the ball, and wherein the maximum lift height of the ball corresponds to the depth of engagement of the ball in the recess, means limiting the movement of the ball on said member so the center of gravity of the ball is located always within the limiting edges, and means operated by upward tilting of said control element as brought about by movement of the ball on said member toward limiting edges of said recess for accurate and highly sensitive initiating of a locking control function as to a safety belt.

4,050,645

YARN CARRIER

Robert L. Burchette, Jr., Spartanburg, and Edward J. Harris, Clemson, both of S.C., assignors to Plastic Injectors, Inc., Spartanburg, S.C.

Filed Oct. 8, 1975, Ser. No. 620,561
Int. Cl.² B65H 75/28
U.S. Cl. 242—125.1 **10 Claims**



1. An improved yarn carrier comprising:

a. an elongated tubular body;

b. yarn hook means provided on said body adjacent, but away from an end thereof, said yarn hook means being engageable with a yarn passing thereby to initiate wrapping same around said body; and

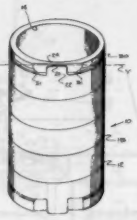
c. a transfer tail receiving groove extending around said body, adjacent, but away from an opposite end of said body to said yarn hook means, said groove being defined by a sloped inner wall with respect to said opposite end of said carrier, an outer wall with respect to said opposite end of said carrier, said outer wall being generally perpendicular to an outer surface of said body and a bottom wall connecting said inner and outer walls and defining a yarn receiving surface, said groove having a height greater than the depth from the outer surface of the body to the yarn receiving surface.

4,050,646

YARN CARRIER

Robert L. Burchette, Jr., 570 El Paso St., Spartanburg, S.C. 29303

Filed Dec. 5, 1975, Ser. No. 638,141
Int. Cl.² B65H 75/28
U.S. Cl. 242—125.1 **7 Claims**



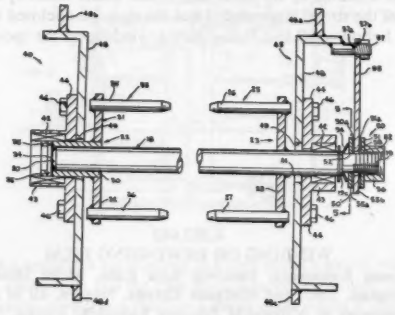
1. An improved yarn carrier comprising a tubular, open ended cylindrical body, said body having at least one yarn receiving slot extending axially therealong, said slot being sized to permit a yarn to pass freely therethrough, said body further having a circumferentially extending groove located at the base of said slot and communicating directly with said slot to receive a yarn transfer tail therein, said groove being defined by a sloped inner wall with respect to a nearest adjacent end of said carrier, an outer wall with respect to said nearest adjacent end of said carrier that is generally perpendicular to a peripheral surface of said body, and a bottom wall connecting said inner and outer walls and defining a yarn receiving surface, said groove having a height greater than the depth from the peripheral surface of the body to the yarn receiving surface.

4,050,647

SUPPORT WITH DRAG ARRANGEMENT

Richard L. Linam, League City, Tex., assignor to Kelso Marine, Inc., Galveston, Tex.

Filed Apr. 5, 1976, Ser. No. 673,587
Int. Cl.² B65H 49/00
U.S. Cl. 242—129.8 **3 Claims**



1. A spool support bearing arrangement for feeding a continuous strand of welding rod including:

a. shaft means;

b. laterally extending means mounted on said shaft means and spaced from one end thereof;

c. spindle means mounted on said laterally extending means and extending in a plane spaced from and parallel to the longitudinal axis of said shaft means;

d. tubular housing means for receiving the other end of said shaft means;

e. a lateral extension on said tubular housing means;

f. spindle means mounted on said lateral extension and extending in a plane spaced from and parallel to the longitudinal axis of said tubular housing means;
g. said spindle means on said lateral extension and on said laterally extending means extending toward each other in the same plane and terminating in spaced relation;
h. means for positioning said tubular housing means with said shaft means;
i. longitudinally spaced bearing means for supporting said tubular housing means and shaft means to accommodate rotation thereof;
j. cooperating friction brake means mounted adjacent one end of said shaft means and on said bearing arrangement adjacent thereto for restraining rotation of said shaft means.

4,050,648

THREAD STORAGE AND DISPENSING SYSTEM

Stevan Tisma, Niles, Ill., assignor to John O. Butler Company, Chicago, Ill.

Filed Nov. 22, 1976, Ser. No. 743,693
Int. Cl.[2] B65H *75/14, 49/00*
U.S. Cl. 242—129.8 **9 Claims**

1. A thread holder comprising a two part shell, one of part of the holder shell including an integral central post coaxially located therein to enable a rotation of a bobbin mounted on said post, bobbin means having a hub region containing a split cylinder with a C-shaped cross section, said cross section embracing said central post, and means in said cross section for contacting and dragging with predetermined friction against the central post, the friction being great enough to prevent an unwanted and random unwinding of the thread from said bobbin and yet small enough to preclude any substantial opposition to a desired withdrawal of thread.

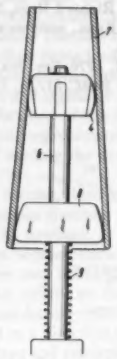
4,050,649

CREELING DEVICE FOR BOBBINS

Walter Haag, Weil der Stadt, Germany, assignor to Albert Haag KG, Weil der Stadt, Germany

Filed May 17, 1976, Ser. No. 686,950
Claims priority, application Germany, May 17, 1975, 7515903[U]
Int. Cl.[2] B65H *49/02;* D03J *5/08*
U.S. Cl. 242—130.1 **5 Claims**

1. A creeling device for textile bobbins, especially for bobbins with conical sleeves, having an interior of differing tapering angle, consisting of a spindle upon which a clamping member of elastomeric synthetic material positively frictionally engaging the interior is arranged having a central section with an outer circumference as well as an axis and resilient ribs distributed outwardly away from though extending axially of the outer circumference of said central section in radially spaced relationshup thereto, said central section including



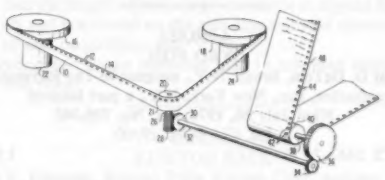
means for limiting the radially inward movement of said ribs resiliently toward the axis of said central section.

4,050,650

SYNCHRONATED INDEX FILM DRIVE MECHANISM

Edward R. Wadleigh, Star Route Box 279, Hemet, Calif. 92343

Filed Jan. 5, 1976, Ser. No. 646,708
Int. Cl.[2] G03B *23/12, 1/04;* G11B *15/32*
U.S. Cl. 242—206 **6 Claims**



5. In a microfilm viewer or the like including: a microfilm supply reel, a microfilm take up reel, means for rotatably mounting said reels at spaced apart locations, a microfilm coupled at respective ends to said supply reel and said take up reel and reelable therebetween, motor means for selectively driving said reels to effect microfilm movement bidirectionally between said reels, the improvement comprising:

a data film capstan mounted on a shaft for rotation about an axis parallel to the axis of said reels and in peripheral engagement with said mircofilm at a point intermediate of said reels,

an index film mounted within said viewer for movement, said index film carrying an index data corresponding to the microfilm data and adapted for viewing during movement of said index film,

an index film capstan mounted on a shaft for rotation about its axis and in peripheral contact with said index film for driving said film, and

geared transmission shaft means mechanically coupling the shaft of said data film capstan and that of said index film capstan for rotation of said index film at a slower speed than that of said data film;

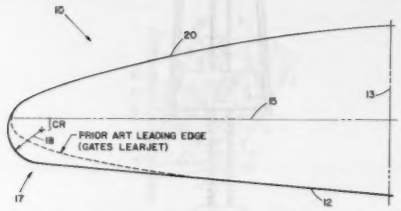
whereby, energization of said motor means and movement of said data microfilm causes said data microfilm to directly drive through said gear transmission shaft means, said index film capstan and said index film in contact therewith at a speed permitting the index data to be visibly read from said moving index film during microfilm movement.

4,050,651

WING AND REDUCED AIRSPEED SYSTEM FOR JET AIRCRAFT

Ronald D. Neal, Wichita; Richard Ross, Sedgwick, and Joseph N. Hein, Wichita, all of Kans., assignors to The Gates Rubber Company, Denver, Colo.

Filed June 24, 1976, Ser. No. 699,391
Int. Cl.² B64C *13/16, 3/10*
U.S. Cl. 244—15 **13 Claims**



13. In a linearly tapered wing of the thin, high speed type having an airfoil section with a root cord of 100% length and a tip cord length as a fraction of the root cord length to define a taper ratio, and upper and lower surfaces defined as fractions of a cord length, the improvement comprising:

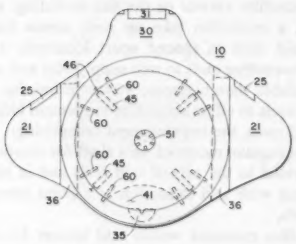
a contoured leading edge having a substantially constant radius dimension selected from the range of about 0.0070 to about 0.0129 of the tip cord divided by the taper ratio, the leading edge radius substantially tangent with the upper surface of the wing and the leading edge fared into the lower surface of the wing within a range of about 6 to about 15 percent of a cord.

4,050,652

GYRO FOIL

Vincent D. DeToia, Bronx, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed July 26, 1976, Ser. No. 708,345
Int. Cl.² B64C *29/00*
U.S. Cl. 244—23 C **1 Claim**



1. An air vehicle formed of a fixed structure to which one of a pair of solid rotatable convex discs is rotatably mounted externally above, and the other of a pair of said discs rotatably mounted externally below said fixed structure about a common vertical axis for providing stability and lift to said structure, together with means to rotate each disc with respect to the said structure in counter-rotating directions relative to each other, in which

the fixed structure is fitted with wings and a tail section that extend beyond the discs, and in which

each disc is formed with a through concentric opening joining a through concentric opening in the fixed structure through said vertical axis, with the internal walls of said openings in the discs and fixed structure fitted with turbine blades to generate lift when the discs are rotated, and with

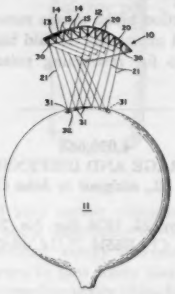
the external surface of each disc shaped to provide aerodynamic lift characteristics when rotated.

4,050,653

BALLOON

Bernard Sayers, Sharp Lane, Newport, N.J. 08345

Filed Mar. 15, 1976, Ser. No. 666,889
Int. Cl.² B64B *1/40*
U.S. Cl. 244—32 **1 Claim**



1. An improved balloon comprising: a main portion for the containment therein of an inflating medium; and an airfoil-shaped member attached to the top surface of said main portion, said airfoil-shaped member comprising a curved skin having a mouth portion, a plurality of longitudinally extending partitions each having a first side member and a second side member, each first side member and each second side member having a first edge attached together to form a line of suspension and a second edge attached to the undersurface of said curved skin, said second edge of said first side member being spaced from said second edge of said second side member in a direction transverse to the longitudinal direction, each said line of suspension having a plurality of loops formed thereon, said plurality of loops of each line of suspension being spaced equally apart in the longitudinal direction, and a plurality of strings for said plurality of loops of each line of suspension, each string having a first end attached to one of said plurality of loops and a second end attached to said top surface of said main portion of said balloon, each of said plurality of partitions comprising a plurality of triangular-shaped reinforcements for each of its first and second side members, said second ends of those strings lying in the same transverse plane being attached to said top surface of said main portion of said balloon at the same point thereon and the points of attachment of said second ends forming a straight line, said top surface of said main portion of said balloon having a reinforcing plate thereon for the attachment of said second ends of said plurality of strings to said points.

4,050,654

HANG GLIDER

Ronald A. Heckman, 88 Crest Road, East, Rolling Hills, Calif. 90274

Filed Dec. 27, 1976, Ser. No. 754,572
Int. Cl.² B64C *3/40*
U.S. Cl. 244—49 **10 Claims**

1. A foot-launched, lightweight, person-carrying wing comprising:

a keel,

right and left leading edge members pivotally connected at their forward ends to the forward end of said keel,

a master hinge bracket slidable on said keel,

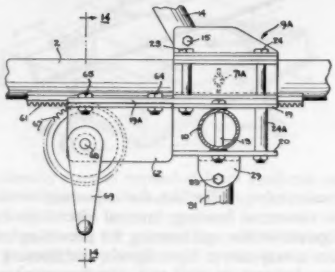
right and left cross brace members pivotally connected at their inner ends to said bracket and at their outer ends respectively, to said right and left leading edge members,

a king post pivotally connected to said bracket and extending upwardly and rearwardly therefrom,

said keel, leading edge members and cross brace members forming a frame,

a control bar pivotally connected to said bracket and having a right and a left leg which extend downwardly and outwardly from said bracket, and a base connecting the ends of said legs,

flexible cables connecting the lower end of the right leg of said control bar to, respectively; the front end of said keel, the rear end of said keel, and the outer end of said right cross brace member,



flexible cables connecting the lower end of the left leg of said control bar to, respectively; the front end of said keel, the rear end of said keel, and the outer end of said left cross brace member,

flexible cables connecting the top of said king post to; the front end of said keel, the rear end of said keel and the outer ends of said right and left cross brace members,

a wing sail covering said frame and connected to said leading edge members along their entire length and to the rear portion only of said keel,

said bracket being movable (a) forwardly to pivot said leading edge members inwardly, said king post downwardly and said control bar upwardly to collapse said frame and (b) rearwardly to erect said frame into operative position.

4,050,655

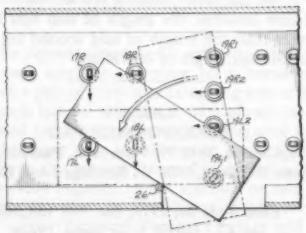
CARGO LOADING METHOD AND APPARATUS

Robert Edgar Bogue, Seattle; Donald Keith Jones, Bellevue; Ray Vere Riggs, Seattle, and Bruno Joseph Vogele, Kirkland, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed June 1, 1976, Ser. No. 691,650

Int. Cl.[2] B64C *1/22*

U.S. Cl. 244—137 R **2 Claims**



1. In a cargo carrying airplane having a floor adapted to carry cargo containers which are longer than the width of the cargo floor, and having a side loading cargo doorway having a forward edge, and having an attenuated pivot-stop disposed at the forward edge of the doorway and protruding above the floor, the cargo floor having disposed therein a plurality of steerable, reversible, retractable, extendible cargo drive rollers including a first, second, third and fourth of the cargo drive rollers being disposed in a line across the width of the cargo floor at a first body station at the center of the doorway and spaced substantially equally from each other and the sides of the floor, the fifth and sixth of a cargo drive rollers being disposed at a second body station forward of the first station by a distance approximately one-half of the floor width, each of said fifth and sixth rollers being located inwardly from a side of the floor by a distance approximately one-fourth of the floor width, and a seventh and eighth of the cargo drive rollers at a third body station forward of the fifth and sixth cargo drive rollers by a distance approximately one-third of the floor width, a method of loading the cargo containers comprising the steps of:

steering said first, second, third and fourth cargo drive rollers in an athwartship direction perpendicular to the longitudinal axis of the fuselage;

powering said first, second, third and fourth rollers to drive a cargo container into the airplane and across said floor;

steering said drive rollers so that the three of said first, second, third and fourth rollers farthest from said doorway are aligned in a direction parallel to the longitudinal axis of the fuselage and retracting the fourth of said drive rollers which is the drive roller nearest the doorway and so that the sixth drive roller which is the drive roller of said fifth and sixth drive rollers farthest from the doorway is aligned in said parallel direction and said fifth drive roller is aligned in said athwartship direction, and so that said seventh and eighth drive rollers are aligned in said athwartship direction; powering said rollers so that said rollers aligned in said parallel direction are driving forwardly, and so that said rollers in said athwartship direction are driving towards the side of the fuselage adjacent said doorway, so that the cargo container is driven against said pivot-stop and is pivoted around said pivot-stop so that the length of said cargo container is aligned fore and aft and positioned on the side adjacent said doorway half of said cargo floor; and

moving said cargo container into its intended location on said floor.

4,050,656

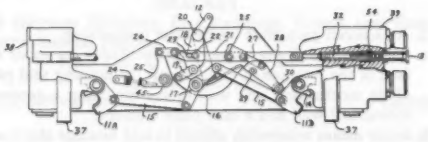
EJECTOR RACK

Paul F. Peterson, Rancho Palos Verdes, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 17, 1976, Ser. No. 687,283

Int. Cl.[2] B64D *1/02*

U.S. Cl. 244—137 R **6 Claims**



1. An ejector rack for releasably supporting, and selectively ejecting forcibly, a store from an aircraft, wherein said store has a plurality of lugs from which said store is removably engaged with and to said ejector rack, comprising:

a. means for releasably supporting said removably engaged store by said store lugs, wherein said means for releasably supporting said store includes:

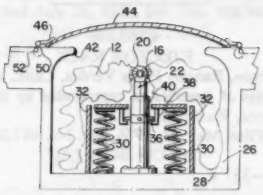
1. two oppositely disposed hooks configurated and dimensioned to accept and to removably engage said store by said store lugs, with said hooks at a preselected distance from each other;

2. suitably dimensioned and configurated linkage disposed between, and interconnecting, said oppositely disposed hooks, whereby said hooks are responsive simultaneously to any movement of said interconnecting linkage;

3. means, connected to said interconnecting linkage, for moving the interconnecting linkage to effect simultaneous movement of said hooks upwardly to close said hooks and thereby to removably engage said store and said store lugs by said hooks, and also to effect simultaneous movement of said hooks downwardly to open said hooks and thereby to disengage and to release said store lugs and said store from said hooks, wherein said interconnecting linkage moving means includes a selectively useable manually operated release handle;
4. means, connected to said interconnecting linkage for selectively preventing any movement of said interconnecting linkage, wherein said interconnecting linkage movement prevention means includes a manually operated safety lock assembly;
5. and, means, connected to said interconnecting linkage moving means, for preventing acceleration forces from acting on said interconnecting linkage moving means and inadvertently causing said interconnecting linkage moving means to move said interconnecting linkage to open said hooks and thereby to disengage and to release said store lugs and said store from said hooks, wherein said inadvertent release prevention means includes a counterbalance assembly;

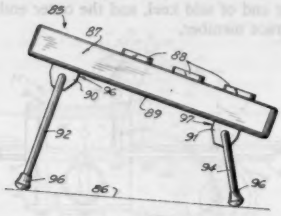
b. means for selectively ejecting said store forcibly, with said ejection means operatively associated with said support means;
c. and, means for attaching said support means and said ejection means to said aircraft.

4,050,657
AIRCRAFT PARACHUTE SAFETY SYSTEM
Philip Murphy, 902 Elm St., Alexandria, Minn. 56308
Filed Sept. 8, 1976, Ser. No. 721,426
Int. Cl.² B64D *17/70, 17/80*
U.S. Cl. 244—139 **2 Claims**



2. An aircraft parachute mechanism comprising:
a. wall means defining a compartment within an upper surface of the fuselage of said aircraft for housing said parachute mechanism, said wall means including a generally cylindrical wall and a base plate element;
b. cover means removably affixed to said fuselage above said compartment;
c. ejector means in said compartment including a horizontally disposed ejector plate member and means yieldingly urging said ejector plate member in an upward ejecting direction, said ejector plate member having a central opening therethrough;
d. a shock absorber having one end affixed to said base plate element and another end extending through said central opening;
e. a parachute stored in said compartment;
f. a plurality of shroud lines connected at one end to said parachute and at the other end to said shock absorber;
g. a remote controlled rotatable sheath on said shock absorber;
h. and cooperating flanges on said sheath and said ejector plate member for releasably holding said ejector plate member against parachute ejecting movements.

4,050,658
FOLDING STAND
Tracy H. Forman, 51 Summit Road, Parsipanny, N.J. 07054; Nat H. Herskowitz, 47 Bannehr St., Oakland, N.J. 07436, and Arthur E. Lawida, 28 Gabriel Way, Westwood, N.J. 07675
Division of Ser. No. 574,956, May 6, 1975, Pat. No. 3,984,074.
This application Apr. 14, 1976, Ser. No. 676,819
Int. Cl.² F16F *15/00*
U.S. Cl. 248—13 **1 Claim**

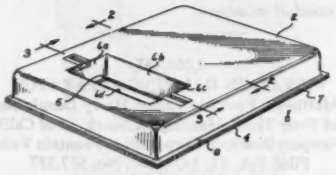


1. In a calculator, or the like, for imparting visual information to a viewer, a housing, internal electronic calculating means disposed within said housing for providing information to a viewer in response to input signals, said housing including foldable means for positioning said calculator upon a surface at an angle with respect to said surface such that the calculator may be operated in a conventional manner without slipping being induced as between the calculator and the surface upon which it is supported, said folding means comprising a first elongated supporting frame member extending from a left side to a right side, a first generally U-shaped leg assembly supported for pivotal movement between support and retracted positions by said first supporting frame member, said leg assembly including transversely spaced friction surfaces for engaging a surface upon which the calculator is to be positioned during use, said first supporting frame member including groove means within which said first leg assembly pivotally moves, said folding means comprising a second elongated supporting frame member extending from a left side to a right side, a second generally U-shaped leg assembly supported for pivotal movement between support and retracted positions by said second supporting frame member, said leg assembly including transversely spaced friction surfaces for engaging the surface upon which the calculator is to be positioned during use, said second supporting frame member including groove means within which said second leg assembly pivotally moves, first fastening means for holding said first frame member to the underside of the calculator housing at a first location, second fastening means for holding said second frame member to the underside of the calculator housing at a second location spaced from said first location, the length of said first leg assembly being greater than the length of said second leg assembly in order to create said angle of operation.

4,050,659
TRANSFORMER PAD
Ralph C. McCannon, 3841 W. Vista Ave., Phoenix, Ariz. 85021, and Jimmie D. Dixon, 4405 W. Berridge Lane, Glendale, Ariz. 85301
Filed June 30, 1971, Ser. No. 158,383
Int. Cl.² H02B *5/00;* **B65A** *19/24*
U.S. Cl. 248—19 **3 Claims**

1. A pad for supporting an electrical transformer over a planar surface, said pad comprising in combination:
a. a high density upper surface of fiberglass reinforced plastic material, said upper surface defining a partially enclosed volume;
b. a high density lower surface of fiberglass reinforced plastic material, said lower surface being secured to said upper surface and fully enclosing the internal volume defined by said upper surface;

c. an internally disposed passageway through said fully enclosed volume for providing physical access between said transformer and said planar surface, said passageway being formed by (i) geometrically corresponding openings through said upper surface and said lower surface and, (ii) a transverse surface of high density, low porosity synthetic material, said transverse surface being integral with, and extending between, the periphery of said geometrically corresponding openings;



d. a low density core of expanded foam synthetic material disposed within and substantially filling the internal volume defined by said upper, lower and transverse surfaces;

e. connection means for connecting said electrical transformer to said pad; whereby said upper, lower and transverse surfaces and said core form an integral semi-rigid support structure.

4,050,660

CASING SUPPORT FOR HORIZONTAL-AXIS CASINGS EXPANDING IN OPERATION

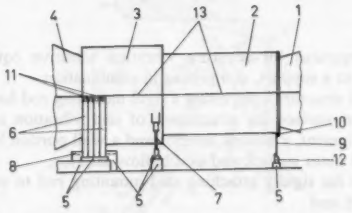
Jean Eggmann, and Max Hartmann, both of Baden, Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed June 2, 1976, Ser. No. 692,235

Claims priority, application Switzerland, July 2, 1975, 8576/75

Int. Cl.² B63B *25/14*

U.S. Cl. 248—19 **19 Claims**



1. A composite support structure for and connected with the casing of a rotary machine operating on a horizontal axis which comprises a pair of vertically extending non-articulated pendulum supports located at opposite sides of said casing, the lower ends of said pendulum supports being secured to a support base and the upper ends to said casing, vertically extending sprung supports also located at opposite sides of said casing for relieving the load imposed by the machine on said pendulum supports, the lower ends of said sprung supports being secured to said support base and the upper ends to said casing, a flexible membrane mounted on said support base and extending horizontally between said pendulum supports beneath said casing, a pin depending from the bottom of said casing in a vertical plane through the axis of said casing and which is secured to said membrane, said pin and membrane acting conjointly to secure said casing against movement in all directions in a horizontal plane but permitting expansion of said casing in a vertical direction relative to said support base, and a metallic sheet structure disposed in a radial plane of said casing and located beneath said casing, the upper end of said metallic sheet structure being secured to the under part of said casing and the lower end being secured to said support base for permitting torsion and/or axial expansion of said casing.

4,050,661

ADJUSTABLE MOUNTING

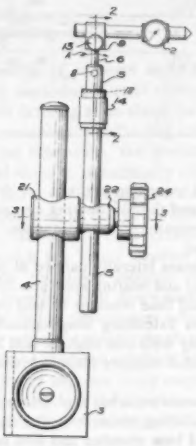
John Wooldridge, Sheffield, England, assignor to James Neill Holdings Limited, Sheffield, England

Filed July 6, 1976, Ser. No. 703,020

Claims priority, application United Kingdom, July 8, 1975, 18708/75

Int. Cl.² A47F *5/00*

U.S. Cl. 248—285 **10 Claims**



1. An adjustable mounting comprising a stem, a mounting member pivotally secured to one end of the stem, a sleeve rotatably mounted on the stem, an inclined end face on the sleeve bearing against the adjacent end of the mounting member on each side of the center axis of the stem and spring means to urge the sleeve against the adjacent end of the mounting member.

4,050,662

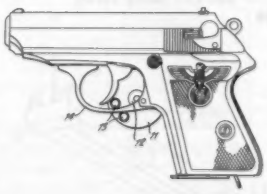
BRACKET

David Harrison Pickering, Five Farthings, Friston near Eastbourne, Sussex, England

Filed Mar. 4, 1976, Ser. No. 663,737

Int. Cl.² A47F *5/00*

U.S. Cl. 248—291 **2 Claims**



1. A support bracket for displaying firearms, said bracket comprising a back disc plate, means for securing same to a substantially vertical structure, a front disc plate, means for pivotally securing the front plate against the backplate at the centers of said plates and for locking said plates in adjusted relative rotational disposition, and two spaced apart forwardly projecting pegs from said front plate, said pegs located off-cen-

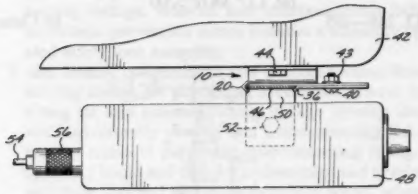
ter of the rotational axis and to receive therebetween a trigger guard of a firearm.

4,050,663

MOUNTING BRACKET

George Alvin Rogers, Yorba Linda, Calif., assignor to Modesett Engineering & Mfg., Yorba Linda, Calif.

Filed Mar. 5, 1976, Ser. No. 664,158
Int. Cl.[2] A47F 5/00
U.S. Cl. 248—316 A 9 Claims



1. A universal mounting bracket, for the removable attachment of a radio and the like bearing a mounting bar bracket to a supporting structure, which comprises:

a base member;

tab support means laterally carried at opposite ends of said base member and bearing apertures for receiving fasteners to secure said base member to said supporting structure;

first lip means extending longitudinally and substantially coextensively with one edge of said base member;

mounting bracket retainer means carried on said base member;

attachment means securing said retainer means to said base member including transverse slot means laterally spaced apart in said base member and first laterally spaced apart upright tab means carried by said retainer means and received in said slot means to permit a limited freedom of sliding movement of said retainer means relative to said base member in a direction normal to said first lip means;

second lip means carried on said retainer means parallel to said first lip means; and

second laterally spaced apart upright tab means carried by said base member in opposed alignment to said first upright tab means;

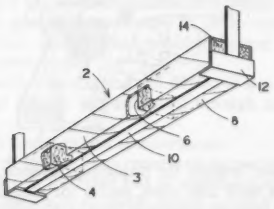
resilient means retained between said first and second upright tab means and biasing said second lip means towards said first lip means whereby said mounting bar can be resiliently restrained therebetween.

4,050,664

OBJECT SUPPORT WITH STRAPPING MEANS

Thomas G. Daley, 9716 Lanesboro Way, Louisville, Ky. 40222

Filed May 27, 1976, Ser. No. 690,435
Int. Cl.[2] B65D 19/00
U.S. Cl. 248—346 8 Claims



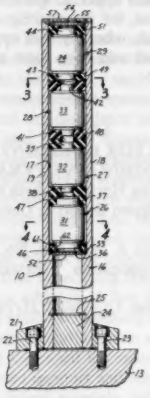
1. A support for an object comprising: at least one conduit base member with means on the top side thereof for receiving an object thereon with securing means attached to the bottom side thereof, said securing means including means to secure said object to said base member, said securing means including a strap holding member adhesively secured to a bottom surface of said conduit member with a strapping member sandwiched therebetween, said strap holding member extending upwardly a preselected distance over a portion of at least one end of said conduit member; said conduit member having disposed at preselected portions therein a resilient foam material, said resilient foam material being affixed to the inner surface of said conduit member and serving to maintain said conduit member in a preselected configuration when said object is mounted onto said conduit member.

4,050,665

VIBRATION DAMPING APPARATUS

John W. Matthews, Fountain Valley; Harry Dennis Sigel, Santa Ana, and Peter Hauk, Huntington Beach, all of Calif., assignors to Newport Research Corporation, Fountain Valley, Calif.

Filed Feb. 11, 1976, Ser. No. 657,337
Int. Cl.[2] F16F 7/10; B23B 29/02
U.S. Cl. 248—358 R 31 Claims



1. Apparatus for securing vibration sensitive equipment relative to a support, comprising in combination:

a rigid structure comprising a rigid mounting rod having an outer surface for attachment of said vibration sensitive equipment, a hollow interior and a wall portion between said outer surface and said hollow interior;

means for rigidly attaching said mounting rod to said support; and

at least two dynamic damping systems in said hollow interior having different resonance characteristics;

one of said dynamic damping systems comprising a first damping mass smaller than said hollow interior and first elastic mounting means for mounting said first damping mass in said hollow interior in spaced relationship to said wall portion; and

the other of said dynamic damping systems comprising a second damping mass smaller than said hollow interior and second elastic mounting means for mounting said second damping mass in said hollow interior in spaced relationship to said wall portion.

4,050,666

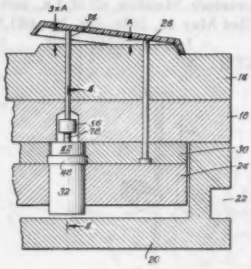
MOLD EJECTOR MULTIPLIER

Jake W. Van Tichelt, 7340 Garden Lane, Portage, Mich. 49081

Filed Nov. 19, 1976, Ser. No. 743,398
Int. Cl.[2] B28B 7/10; B29C 7/00; B29F 1/14
U.S. Cl. 249—68 31 Claims

1. In an apparatus for forming a workpiece which comprises

separable forming elements in which a workpiece is formed and in which, when the elements are separated, the workpiece must be removed from one of them, ejector means adapted to engage said work piece and to dislodge it from said one element, ejector actuating means for engaging said ejector means to cause it to move to and from a position at which it engages



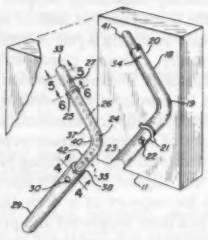
and dislodges said workpiece, ejector multiplier means responsive to the movement of said ejector actuating means to multiply the extent and speed of movement of said ejector means, the improvement in said ejector multiplier means which comprises hydraulic means for accelerating the movement of the ejector means responsive to the movement of said ejector actuating means.

4,050,667

TUBE MOLD

Allen J. Kossett, Libertyville, Ill., assignor to Will Ross, Inc., Milwaukee, Wis.

Filed Nov. 26, 1975, Ser. No. 635,683
Int. Cl.² B22C *9/24*; A61M *25/00*; B29F *1/00*
U.S. Cl. 249—82 **7 Claims**



1. A molding apparatus comprising:

a. a bottom plate having a first groove therein;

b. a top plate having a second groove therein and overlaying said bottom plate such that said first groove and said second groove define a cavity, said cavity having a downstream end and an upstream end;

c. first core means removably mounted within said cavity and in a spaced relationship from the walls of said cavity;

d. annular means disposed between the walls of said cavity and said first core; and

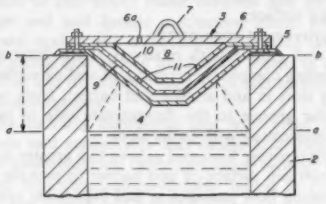
e. an injection port at said downstream end of said cavity between said annular means and said downstream end whereat material injection is initiated, said annular means being slidable by means of said injection fluid along said core from a first position adjacent said injection port to a second position remrote from said first position in the direction of the upstream end of said cavity.

4,050,668

INGOT MOLD WITH HEAT REFLECTING COVER

Joseph Perri, 10 Dendron Drive, Coraopolis, Pa. 15108

Filed Sept. 27, 1976, Ser. No. 727,281
Int. Cl.² B22D *7/06*
U.S. Cl. 249—106 **8 Claims**



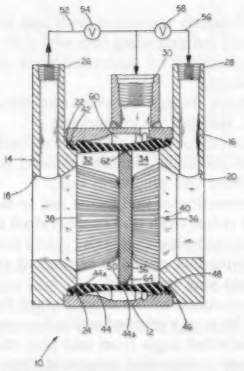
1. In the combination of an ingot mold having vertically extending side walls enclosing a mold cavity with the upper ends of the side walls defining a rim about the upper end of the mold cavity, and a reusable heat reflecting cover supported on the upper end of the side walls, the invention wherein the cover is of a size and shape to substantially close the upper end of the cavity when the cover is in position over the cavity and is seated on the upper ends of the side walls of the mold surrounding the cavity, the reusable cover comprising at least two members, one of which is a lower member and the other of which is a top plate, the lower member comprising a heat reflector arranged to reflect heat downwardly into the mold cavity and having a dished central area which extends down into the mold cavity when the cover is in place on the mold but which is at a level above the level to which hot metal is poured into the mold, the lower member being suspended around its edges from the undersurface of the top plate, and an insulating air space between the dished central area of the lower member and the top plate.

4,050,669

EXPANSIBLE TUBE VALVES

Richard S. Brumm, Orinda, Calif., assignor to Grove Valve and Regulator Company, Oakland, Calif.

Filed Dec. 4, 1975, Ser. No. 637,820
Int. Cl.² F16L *55/14*
U.S. Cl. 251—5 **2 Claims**



1. In an expansible tube valve comprising:

a housing with inlet and outlet flow passageways therein:

a core of circular cross-section in said housing with opposite open ends thereof aligned with said flow passageways;

said core having two axially spaced series of inlet and outlet slots therearound;

a barrier across said core intermediate said inlet and outlet slots having a sealing surface therearound;

an expansible tube on said core having an intermediate sealing portion normally snugly embracing said sealing surface; and

a port in said housing for admitting pressure fluid therein against said expansible tube to construct it around said sealing surface;

the improvement comprising:

an annular groove with relatively sharp outer side edges extending completely around said sealing surface: and

venting slots in and around said barrier, from within said annular groove to the downstream side of said barrier communicating with outlet slots;

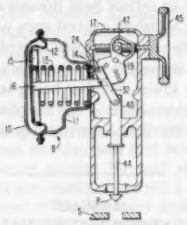
said slots tapering from said groove to a greater depth at the downstream surface of said barrier to provide gradually increasing flow passages as said expansible tube expands away from said sealing surface progressively from the upstream thereof.

4,050,670

VARIABLE FORCE ACTUATOR

Karl S. Borg, Sudbury, and Gareth A. Keith, Sherborn, both of Mass., assignors to Masonellan International, Inc., Norwood, Mass.

Filed Feb. 5, 1976, Ser. No. 655,453
Int. Cl.² F16K *31/115*
U.S. Cl. 251—14 **19 Claims**



1. An actuator for stroking a valve having a body and a plug stem projecting on an axis therefrom and shiftable between initial and final limit positions, comprising

a yoke attached to said body and received over said plug stem;

a powerhead fixedly associated with said yoke;

an input thrust rod extending into said yoke from said powerhead and shifted by controlled fluid pressures on said powerhead; and

a variable force linkage between said thrust rod and said plug stem, said linkage comprising

a support shaft mounted in said yoke on said plug stem axis,

a main lever pivotally mounted on said support shaft for rotating about said plug stem axis,

a pivotal connection of said thrust rod to said main lever at a selected radius from said support shaft and at a selected angle from said plug stem axis,

an output thrust link pivotally connected at its one end for shifting said plug stem, and

a pivotal connection of the other output thrust link end to said main lever at a selected radius from said support shaft and at a selected angle from said plug stem axis,

said link-lever connection separated from said rod-lever connection by a least one of their said selected radii and angles being differently chosen,

for valve closing mechanical advantage of the output stroking of said thrust link over the input stroking of said thrust rod, and

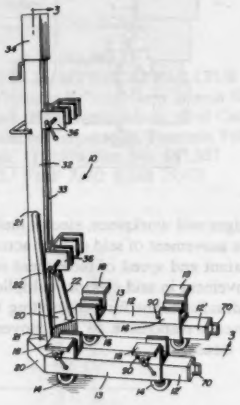
such that in valve closing the actuator output shifting of said plug stem by said output thrust link is at an increasingly varying rate of change of force relative to the actuator input rotation of said main lever by said input thrust rod.

4,050,671

DOOR HANGER DEVICE

Ronald J. Coleman, Marrero, La., assignor to Victor S. Mott, Gretna; Gilbert Groetsch, Metairie; John R. Johnston, Gretna and Ewald Groetsch, Metairie, all of, La., part interest to each

Filed May 18, 1976, Ser. No. 687,544
Int. Cl.² B66F *3/08*
U.S. Cl. 254—7 R **2 Claims**



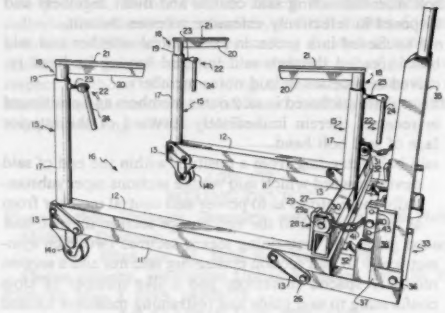
1. A dolly for transporting a plurality of doors and supporting a door while the latter is being hung, said dolly including horizontal and vertical support structures, said horizontal structure including a pair of side-by-side legs having front and rear ends interconnected by a transverse connecting structure extending and rigidly connected between the rear ends of said legs, the lower end of said vertical structure being anchored and braced relative to said connecting structure, said horizontal structure including depending support wheel assemblies supported from the front and rear ends of said legs, said vertical support structure including a pair of vertically spaced apart and aligned forwadly opening clamp structures supported therefrom for adjustable shifting therealong with said clamp structures spaced forwardly of said vertical support structure, said legs being free of transverse connections extending therebetween forwardly of a vertical transverse plane containing said clamp structures, said legs each being provided with longitudinally spaced and aligned upwardly opening front and rear clamp structures for support of a door therefrom in spaced relation relative to a door supported and projecting forwardly from said vertically spaced apart clamp structures in a vertical plane spaced between said legs, adjustment means operative to adjustably position said vertically spaced clamp structures along said vertical support structure, an upstanding extension removably supported from the upper end of said vertical support structure, horizontally forwardly opening clamp means mounted on said upstanding extension for adjustable shifting therealong, and connecting means connecting said clamp means and said vertically spaced clamp structures for simultaneous and equal shifting relative to said vertical extension and said vertical support member, said adjustment means including first screw shaft journalled from said vertical support structure and threadedly engaged with said vertically spaced clamp structures, second screw shaft means journalled from said upstanding extension and threadedly engaged with said forwardly opening clamp means, said second screw shaft member being vertically aligned with and disposed above said first screw shaft member and removably coupled thereto for rotation therewith.

4,050,672

TRAPEZOIDAL LIFTER

Perry Joe Lane, Rte. 1, Scobey, Miss. 38953

Filed Feb. 4, 1977, Ser. No. 765,698
Int. Cl.[2] B66F 7/26
U.S. Cl. 254—10 R 5 Claims



1. An apparatus for lifting and moving an object supported above a floor, said apparatus comprising:

a lower three-sided frame having an open forward end, two side portions, and a rear portion connecting said side portions;

an upper three-sided frame of smaller length than said lower frame above said lower frame, said upper frame having an open forward end corresponding to said open end of said lower frame, two side portions and a rear portion connecting said side portions;

shackle means pivotably connected between said upper frame and said lower frame for pivoting on said lower frame and lifting said upper frame from said lower frame and for supporting said upper frame above said lower frame;

wheel means beneath said lower frame for moving said connected frames from place to place;

upright support means connected to and extending upward from said upper frame and adjustable vertically and horizontally for supporting from beneath said object to be lifted and moved;

at least one chain connector attached above the rear portion of said upper frame;

a chain connected to each chain connected at one end thereof;

at least one angled latch member connected beneath and extending rearward from the rear portion of said upper frame;

handle mechanism means pivotably mounted on the rear portion of said lower frame and connected to the end of said chain opposite the end connected to said chain connector for pulling said chain and said upper frame backward and upward;

locking latch means connected to the rear portion of said lower frame opposite each angled latch member for engaging said angled latch member when said upper frame is pulled backward and for locking said upper frame in the raised position, said latch means having a first spring hole therethrough;

a rocker arm pivotably mounted onto the rear portion of said lower frame next to each locking latch means, one end of said rocker arm extending toward and underneath said locking latch means;

a spring guide mounted on the end of said rocker arm opposite the end extending toward said locking latch means;

foot pedal means mounted on the rear portion of said lower frame adjacent said rocker arm, a portion thereof extending over the end of said rocker arm having said spring guide for pressing against and depressing said rocker arm when said foot pedal is depressed, said foot pedal further having at least one spring hole therethrough;

a tension spring fitted through said spring hole in said foot pedal, said spring guide, and said spring hole in said locking latch means; and

combination member means pivotably mounted on the rear portion of said lower frame between said locking latch means and said handle mechanism means for pivoting upward against and unlocking said locking latch means, for locking said handle mechanism means in an upright position and for holding the end of said spring and being tensioned thereby;

whereby partially depressing said foot pedal means depresses said rocker arm and causes said rocker arm to pivot upward against said combination member means and causes said combination-member means to rotate away from and release said handle mechanism means,

whereby further depressing of said foot pedal means causes said rocker arm to pivot upward further against said combination member means and causes said combination member means to rotate against and lift said locking latch means, and

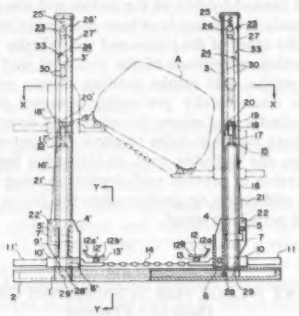
whereby upon removing pressure from said foot pedal means, said tension spring through said foot pedal means causes said foot pedal means to return to its upright position, causes said locking latch means to be pulled downward, and causes said combination member means to rotate toward said handle mechanism means and away from the position of lifting said locking latch means.

4,050,673

TWO-MASTED LIFTING APPARATUS

Matsuo Nishimura, Tokyo, Japan, assignor to Yasui Sangyo Col. Ltd., Japan

Filed Dec. 10, 1976, Ser. No. 749,364
Claims priority, application Japan, Sept. 17, 1976, 51-110864; Oct. 21, 1976, 51-125540
Int. Cl.[2] B66F 7/12
U.S. Cl. 254—89 H 6 Claims



1. A two-masted lifting apparatus particularly adapted to lift up a weighty object such as a vehicle or the like to a desired height and incline said lifted object at a desired angle, said apparatus comprising: a base,

a pair of upright masts disposed on said base and opposing each other,

a first carriage slidably mounted to one of said masts,

a second carriage slidably mounted to the other of said masts,

a pair of driving means adapted to hoist up or down said carriages independently of each other along the respective masts,

supporting arms for supporting the object to be lifted, each supporting arm being slidably supported on the carriage

so as to be movable toward or away from the opposing mast, and

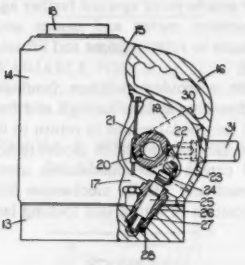
a height-difference detecting means adapted to detect the height difference between said carriages and restrict the further ascent or descent of one of the two carriages when the detected height difference between the two carriages has reached a predetermined limit.

4,050,674

HYDRAULIC JACK

Joseph Henry Robbins, deceased, late of Birmingham, England, by George Trevor Palfreyman and Roger Jerome Guy, executors, and John Edward Acton, Willenhal, England, assignors to Tangye Limited, Birmingham, England

Filed Dec. 27, 1976, Ser. No. 754,214
Int. Cl.[2] B66F *3/24*
U.S. Cl. 254—93 H **7 Claims**



1. A hydraulic jack comprising a cylinder, a piston slidable relative within the cylinder, an inlet in the cylinder, a pump for supply of fluid under pressure to said inlet to move the piston, a seal between the piston and the cylinder, means for limiting the stroke of the piston in the cylinder by permitting fluid pumped into the cylinder, once the piston reaches the end of its permitted stroke, to escape from the cylinder to a zone of relatively low pressure, said stroke limiting means comprising an element carried by one of the piston and the cylinder and urged towards a position in which it engages in a recess or groove in the other of the piston and the cylinder positively to prevent further movement of the piston at said end of said permitted stroke, said stroke limiting means, when so activated, also mechanically preventing removal of the piston from the cylinder, and means for selectively de-activating said stroke limiting means in order to allow said piston to be withdrawn from the cylinder, said de-activating means being a device operable to prevent said element moving into engagement with said recess or groove when the piston reaches said end of said permitted travel.

4,050,675

BATTERY WEDGE FOR SUBMARINES OR OTHER INSTALLATIONS

Adolph V. Mongillo, New Haven, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 6, 1976, Ser. No. 729,921
Int. Cl. B66f *11/00*
U.S. Cl. 254—104 **3 Claims**

1. In a wedge device for spacing apart or elevating or lowering objects wherein a central member is movable with respect to adjoining outer members and all components are required to be contained entirely within the envelope formed by the outer surfaces of said outer members the improvement comprising:

a linear succession of dual-faced oppositely-angled wedge sections in said central member,

the inner surfaces of said outer members mating with the adjoining surfaces of said central member when in the initial condition;

a bolt interconnecting said central and outer members and disposed in selectively extensive recesses therein,

a nut anchored in a recess in said central member and said bolt threaded through said nut and having its head received in recesses in said outer members,

a thrust plate anchored in said outer members and positioned in recesses therein immediately forward of the interior face of said bolt head,

said bolt extending from a position within the end of said device toward which said wedge sections taper substantially thereinto so as to power said central member from at least the next to the end wedge section thereof; and

spaced guide and restraining means secured two each symmetrically to said section containing said nut and a section remotely spaced therefrom and a like number of slots conforming to said guide and restraining members formed in said outer members,

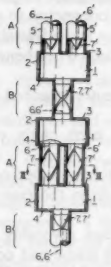
whereby all operative components are contained within the outer configuration of said device permitting unrestricted placement thereof and both expansion and contraction of said outer members by operation of said bolt.

4,050,676

MIXING DEVICE AND ELEMENT THEREFOR

Yasushi Morishima, 836, Aza Mori, Kokuba 1-chome, Otsu, and Yukifusa Miyazaki, 550, Aza Iwaden, Yabase-cho, Kusatsu, both of Japan

Continuation of Ser. No. 462,537, April 19, 1974, abandoned.
This application Dec. 2, 1975, Ser. No. 636,953
Int. Cl.[2] B01F *15/00*
U.S. Cl. 366—339 **8 Claims**



1. A device for mixing substances, such as fluids and finely divided particles, the device comprising: at least two mixing elements in a stacked, substantially axial, serially connected arrangement; each element including at least two parallel passages having substantially the same inner diameter and axes that are all in a common plane; with spiral vanes secured inside said passages, having straight entry edge lines, the entry edge line in one passage of each said at least two passages being substantially parallel to that of said vane in at least one other passage, and said entry edge lines intersecting the common plane at 70° to 110°; the common plane of one mixing element being out of phase by 60° to 120° with respect to that of a successively stacked mixing element; each element further including a collecting and dividing chamber provided on and connected to one end of said at least two passages; which chambers serially alternate with said passages; said chambers having portions with a transversal inner diameter somewhat

larger than the sum of the inner diameters of the associated ones of said passages, the centers of said chambers being all substantially in the common plane; and a plane including a line extending between the centers of each of said at least two passages in one mixing element intersecting a plane including a corresponding line of the successive element; the substances being collected in said chambers, then divided into said at least two passages, further twisted therein by said vanes, again collected in a succeeding chamber, and still further divided in a direction different from a preceding divided direction into said at least two passages that are placed out of phase with respect to those of a preceding element, whereas the substances are alternatively twisted and multilayered, so that a complete mixing effect is attained.

4,050,677

MIXING DEVICE

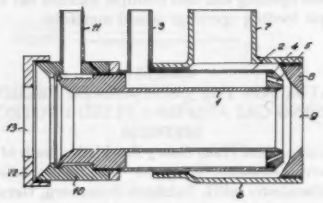
Finn Benthin, Holbaek, Denmark, assignor to A/S Hotaco, Holbaek, Denmark

Filed Jan. 13, 1976, Ser. No. 648,806

Claims priority, application United Kingdom, Jan. 20, 1975, 2289/75; May 2, 1975, 18408/75

Int. Cl.² B01F *5/18;* B28C *5/06*

U.S. Cl. 366—11 **6 Claims**



1. In a device for the in situ formation of fibre-reinforced construction materials, such as mortars and plastics, such device being of the type including an elongate member, means to introduce fibres into a first end of said elongate member, and means for mixing construction material to be reinforced with said fibres at a second end of said elongate member, the improvement comprising:

said elongate member comprises a cylindrical inner tube having first and second ends, said fibres being introduced into said first end of said inner tube;

first gas connection means adjacent said first end of said inner tube for supplying gas into said inner tube to convey said fibres through said inner tube from said first end through said second end thereof;

a jacket surrounding said inner tube and having first and second ends, said first end of said jacket being connected to said inner tube, said second end of said jacket positioned adjacent but radially outwardly of said second end of said inner tube, said jacket and inner tube defining therebetween an annular first space;

an outer tube surrounding said jacket and having first and second ends, said first end of said outer tube being connected to said jacket, said second end of said outer tube extending axially beyond said second ends of said inner tube and said jacket, said outer tube and said jacket defining therebetween an annular second space;

connection means attached to said outer tube for introducing construction material to be reinforced into said second space and conveying said material through said second space in a direction toward said second end of said outer tube;

plug means positioned within said outer tube at said second end thereof for conveying said material from said second space toward said fibres passing through said second end of said inner tube, to thereby form a material-fibre mixture, said plug means having a central opening therethrough for passage of said mixture;

second gas connection means attached to said jacket for introducing gas into said first space and conveying said gas in a direction toward said second ends of said inner tube and said jacket; and

closure means positioned adjacent said second ends of said inner tube and said jacket for closing said first space, said closure means having extending therethrough inclined passage means surrounding said inner tube and extending from said first space toward said plug means and radially inwardly, for forming at least one gas jet surrounding said inner tube, said passage means being dimensioned to direct said at least one gas jet against said material being conveyed toward said fibres to disrupt said material into drops before mixture thereof with said fibres.

4,050,678

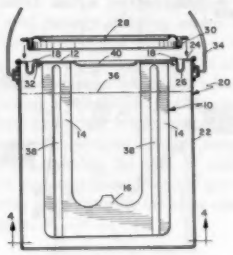
CONTAINERIZED LIQUID STIRRER

Charles S. Smith, 2842 Merton Ave., San Diego, Calif. 92111

Filed Dec. 3, 1975, Ser. No. 637,364

Int. Cl.² B01F *11/00*

U.S. Cl. 366—130 **3 Claims**



1. A liquid stirrer for a container having a body portion with a bottom and a rim having an annular shoulder and a removable lid mountable on said rim, said stirrer comprising:

a. a spanner bar removably extendable across a diameter of said annular shoulder and having a lip defined at each end thereof engageable between said annular shoulder and said lid such that said spanner is completely enclosed and firmly secured within a container when engaged by said lid and annular shoulder;

b. a spatula depending from said spanner bar and comprising a pair of generally parallel blades to extend into said container and including a transverse blade joining the distal ends of said parallel blades;

c. said spatula being semi-flexible to yield in use to swirling fluid in said container and extending into said container when said spanner bar is extended across said rim whereby said stirrer can be inserted into and completely enclosed within a container of liquid and captured by said lips between said rim and said lid to permit stirring of said liquid by reciprocal rotation of said can.

4,050,679

METHOD AND APPARATUS FOR CONTROLLING THE FURNACE TOP GAS PRESSURE OF BLAST FURNACES

Kiyotoshi Sakai, 12-3-503, Tenjin 1-chome, Tobata, Kita-Kyushu, Fukuoka, Japan

Filed Oct. 27, 1976, Ser. No. 736,108

Claims priority, application Japan, Nov. 9, 1975, 50-134829

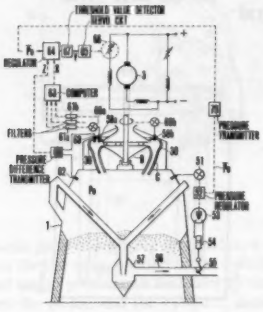
Int. Cl.² C21B *7/00*

U.S. Cl. 266—44 **5 Claims**

1. In a blast furnace installation comprising a blast furnace and a raw material charging apparatus including a hollow inverted frustum shaped rotary hopper mounted above said blast furnace, conveyor means for supplying the raw material

to said rotary hopper, a hollow disc shaped impeller located beneath said rotary hopper for receiving the raw material therefrom, stationary inclined chute means including an annular chamber member surrounding the periphery of said impeller for receiving the raw material discharged therefrom, and an electric motor mounted above said rotary hopper for driving said impeller, a method of controlling the gas pressure in the top of said blast furnace comprising the steps of detecting the gas pressure in said annular chamber member of said inclined chute means at a plurality of circumpherencially spaced points, comparing the mean value of said detected gas pressures with a preset furnace top gas pressure for producing a control signal proportional to the difference therebetween, and controlling the speed of said motor by said control signal thereby reducing substantially to zero the amount of the gas discharged to the atmosphere from said impeller.

3. In a blast furnace installation comprising a blast furnace and a raw material charging apparatus including a hollow inverted frustum shaped rotary hopper mounted above said blast furnace, conveyor means for supplying the raw material to said rotary hopper, a hollow disc shaped impeller located



beneath said rotary hopper for receiving the raw material therefrom, stationary inclined chute means including an annular chamber member surrounding the periphery of said impeller for receiving the raw material discharged therefrom, and an electric motor mounted above said rotary hopper for driving said impeller, apparatus for controlling the gas pressure in the top of said blast furnace comprising a main control system detecting the furnace top gas pressure to control, in accordance with a predetermined furnace top gas pressure, the amount of gas discharged through a gas exhaust conduit, a plurality of pressure detectors provided for said annular chamber member at equally spaced points around the periphery of said annular chamber member, a plurality of electric signal generators responsive to the outputs of said pressure detectors, respectively, a computer for producing the mean value of the electric signals produced by said electric signal generators, a regulator for producing an output proportional to the difference between said mean value and the predetermined furnace top gas pressure, and servo-means responsive to the output from said regulator for controlling the speed of said motor thereby reducing substantially to zero the amount of the gas discharged to the atmosphere from said impeller.

4,050,680

CUTTING TORCH ARRANGEMENT

Patrick E. Sweeney, Baltimore, Md., assignor to AAI Corporation, Cockeysville, Md.

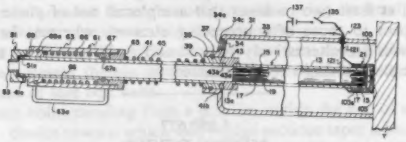
Filed Nov. 3, 1975, Ser. No. 628,009
Int. Cl.² B23K 7/10
U.S. Cl. 266—48 **11 Claims**

1. A cutting torch arrangement comprising

a plurality of longitudinally extending thermal bars each comprising a burner pipe having combustible rod-like elements extending along a length thereof, with longitudinal gas passageways formed therebetween for feeding of oxygen gas along the interior of said pipe and enabling igniting and burning of one end of said thermal pipe,

and composite support means compositely supporting said thermal bars at one end thereof remote from the opposite end thereof and having gas flow passageway means formed therein connecting with the interior of each of said thermal bars,

said composite support means comprising a common securing, supporting and gas feed manifold having a common gas feed opening therein and multiple thermal bar-supporting and gas feeding openings for secured supporting engagement with corresponding respective ones of a plurality of thermal bars,



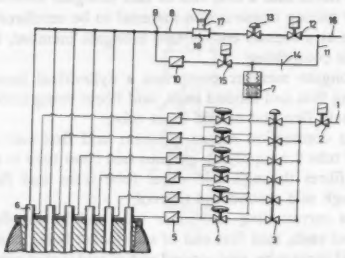
and a common gas manifold chamber formed within said securing, supporting and gas feed manifold and connecting in gas flow connecting relation between said common gas feed opening and said multiple thermal bar-supporting and gas feeding openings is said manifold.

4,050,681

APPARATUS FOR THE CONTROLLED FEEDING OF A REFINING GAS AND OF A FLUID PROTECTIVE MEDIUM

Karl Brotzmann, and Hans Georg Fassbinder, both of Sulzbach-Rosenberg, Germany, assignors to Eisenwerk-Gesellschaft Maximilianshutte mbH, Sulzbach-Rosenberg, Germany

Filed May 10, 1974, Ser. No. 468,967
Claims priority, application Germany, May 25, 1973, 2326754
Int. Cl.² C21C 5/34
U.S. Cl. 266—82 **11 Claims**



1. In an apparatus for supplying a refining gas and for supplying a fluid protective medium individually to each of a plurality of tuyeres mounted in the refractory masonry of a refining vessel each of said tuyeres consisting of at least two concentric pipes with separate supply lines to supply said refining gas and to supply said protective medium, the refining gas passing through the center pipe and the protective medium passing through the annular spaces between said concentric pipes; and including a control valve (3) in the supply lines (1) through which said protective medium is supplied to each of said tuyeres, a pressure reducing valve (4) in each of said supply lines in series with said control valve (3), and a back pressure valve (5) between each of said tuyeres and each of said pressure reducing valves in each supply line of said protective medium, and

the improvements which comprise: means to control each of said pressure reducing valves (4) said means comprising a pressure transmitter (7) operatively connected to a by-pass

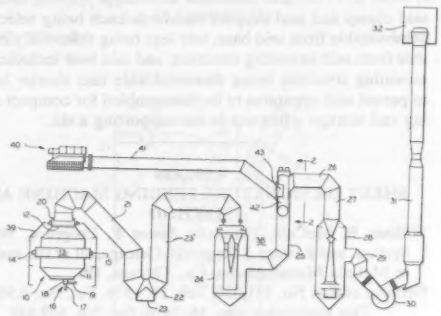
line (11) of said main refining gas supply line (16) and said pressure transmitter (7) transmitting the pressure fluctuations of the refining gas line to each of the pressure reducing valves (4) mounted in each of said protective medium lines, whereby the pressure of said protective medium flowing to said tuyeres is individually controlled and changed by the pressure reducing valves (4) in relation to the refining gas pressure in such a way that the pressure in each of said protective medium lines cannot exceed the pressure in the refining gas line.

4,050,682

METHOD AND APPARATUS FOR HANDLING OFF-GASES FROM METAL REFINING VESSEL

Joerg Peter Baum, Essen-Sud, Germany, assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed Mar. 31, 1975, Ser. No. 563,844
Int. Cl.[2] C21C 5/40
U.S. Cl. 266—158 23 Claims



1. Metallurgical apparatus including,
a metallurgical vessel having an open upper end and means for delivering process gases to a quantity of metal contained therein,
means for tilting said vessel between first and second positions, a gas cleaning system,
first gas collecting hood means for collecting off-gases from said vessel when the same is in its first position,
first conduit means for connecting said first gas collecting hood means to said gas cleaning system,
second gas collecting hood means for collecting off-gases from said vessel when said vessel is in its second position,
second conduit means for connecting said second gas collecting hood means to said gas cleaning system,
damper means for coupling and uncoupling said second conduit means and said gas cleaning system,
said damper means including third conduit means defining a passage and having an inlet coupled to said second conduit means and an outlet connected to said gas cleaning system, said third conduit means having a first portion lying between said inlet and said outlet to define a flow path and a second portion lying outside of said path,
and a bell damper disposed in said third conduit means and including a body portion and being movable longitudinally therein between a first position so that said body portion projects into the first portion of said conduit means and between said inlet and said outlet for interrupting the flow path between said inlet and said outlet and a second position in the second portion of said third conduit means wherein the body portion is spaced from the flow path between said inlet and outlet, said body portion being sized to substantially occupy the first portion of said conduit means when in said first position to prevent the accumulation of gases therein.

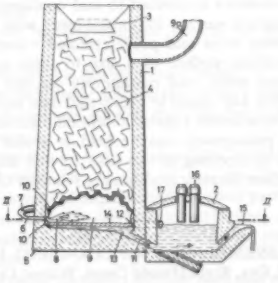
17. Metallurgical apparatus including,
a metallurgical vessel having an open upper end and means for delivering process gases to a quantity of metal contained therein,
means for tilting said vessel between first and second positions, a gas cleaning system,
first gas collecting hood means for collecting off-gases from said vessel when the same is in its first position,
first conduit means for connecting said first gas collecting hood means to said gas cleaning system,
second gas collecting hood means for collecting off-gases from said vessel when said vessel is in its second position,
second conduit means for connecting said second gas collecting hood means to said gas cleaning system,
damper means for coupling and uncoupling said second conduit means and said gas cleaning system,
said damper means including means defining a passage and having an inlet coupled to said second conduit means and an outlet connected to said gas cleaning system, said passage defining means having a first portion lying between said inlet and said outlet to define a flow path and a second portion lying outside of said path,
and a damper element disposed in said passage defining means and being movable between a first position within the first portion thereof and between said inlet and said outlet for interrupting the flow path between said inlet and said outlet and a second position in the second portion of said passage defining means wherein a flow path between said inlet and outlet is open,
said second gas collecting hood includes an enclosure having a bottom opening and side walls, a portion of said side walls comprising a plurality of flexibly connected individual members to permit engagement thereof by vessel charging apparatus without damage thereto, said second conduit means opening the side of said enclosure and baffle means disposed in said second gas collecting hood for redirecting gases entering the same toward said second conduit means.

4,050,683

SMELTING PLANT AND METHOD

Hans Jürgen Langhammer, Platienwerbe, Germany, assignor to Klockner-Werke AG, Duisburg, Germany

Division of Ser. No. 689,859, May 25, 1976. This application Feb. 2, 1977, Ser. No. 764,918
Int. Cl.[2] C21C 7/00
U.S. Cl. 266—164 5 Claims



1. A smelting plant comprising: a shaft furnace having a floor and defining an upright elongated chamber; means for feeding metal-containing materials into the top of said chamber for forming therein an upright column of said materials; means including a burner above the floor of said furnace for forming a flame at the base of said column, whereby said materials at the base of said column are melted into a liquified-metal melt and a layer of slag on said melt and a deposit is formed in said furnace, said column being supported on said deposit; a slag drain in said furnace at the level of said deposit for withdrawal

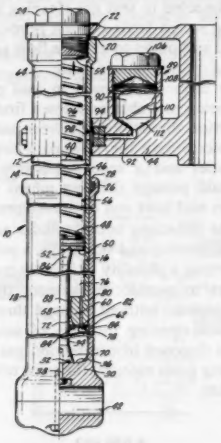
of said slag; a metal-drain conduit having an inlet end opening into said furnace below said layer and an outlet end substantially at said layer and formed as a trap preventing flow back into said furnace, whereby said metal passes out of said furnace through said conduit and remains at a level in said furnace determined by the level of said outlet end; and means for heating metal in said conduit between said ends.

4,050,684

VELOCITY SENSITIVE DUAL RATE SHOCK STRUT

Franklin C. Sanders, 13712 Prospect Ave., Santa Ana, Calif. 92705

Filed July 19, 1976, Ser. No. 706,798
Int. Cl.[2] F16F *9/48*
U.S. Cl. 267—65 R **16 Claims**



15. A device for modifying the reaction of a shock strut to retraction and extension forces, the shock strut being of the kind containing fluid as a damping agent and gas as a spring agent, wherein the fluid and gas have an interface which moves to different levels in the strut in response to the extension and retraction forces applied to the strut, said device including:

a container defining a predetermined volume; and

a base member connected to said container having a semi-cylindrical surface for engagement with the strut, a passageway from said predetermined volume to said semi-cylindrical surface of a size to form an orifice, a seal formed about said passageway on said semi-cylindrical surface, and means to clamp said base member to the strut and to maintain a sealed condition therebetween, whereby said passageway can be held in sealed communication with an opening in the strut so that the passage of the interface thereby modifies the reaction of the shock strut.

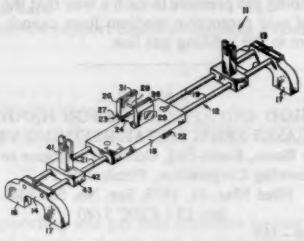
4,050,685

DISASSEMBLABLE SKI CLAMPING APPARATUS

Robert C. Cox, Eight Harold Court, Walnut Creek, Calif. 94598

Filed Oct. 6, 1976, Ser. No. 730,217
Int. Cl.[2] B25B *1/20*
U.S. Cl. 269—296 **12 Claims**

1. Apparatus for firmly supporting a ski during work thereon, comprising a base including an elongated mounting structure from which said ski is to be supported; a clamp projecting from said mounting structure adapted to grip a ski to be supported generally at the midportion thereof; a pair of support standards projecting from said mounting structure in generally the same direction from which said clamp extends therefrom and on opposite sides of said clamp and spaced therefrom to engage said ski at locations spaced from said clamp; and legs at opposite ends of said mounting structure depending therefrom for supporting the same on a work surface; and means for reducing the distance of said clamp from said base relative to the distance therefrom at which said support standards engage said ski to urge said ski against said support standards for lateral support thereof at said locations;



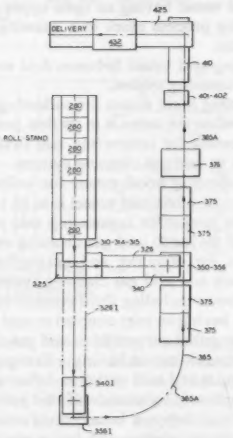
said clamp and said support standards each being selectively demountable from said base, said legs being selectively removable from said mounting structure, and said base including said mounting structure being disassemblable into shorter lengths to permit said apparatus to be disassembled for compact carrying and storage when not in use supporting a ski.

4,050,686

SHEET OR SIGNATURE FEEDING MACHINE AND METHOD

William B. McCain, Hinsdale; James F. Cosgrove, Western Springs, and Edward J. Zagorski, Chicago, all of Ill., assignors to McCain Manufacturing Co., Chicago, Ill.

Division of Ser. No. 441,056, Feb. 11, 1974, Pat. No. 3,966,185.
This application Jan. 16, 1976, Ser. No. 649,639
Int. Cl.[2] B65H *39/02*
U.S. Cl. 270—54 **4 Claims**



1. A machine for producing signatures and forming books therefrom comprising: a signature gathering conveyor, a roll stand having spaced spindles for supplying rolled webs of paginated printed material, means to withdraw web lengths from the rolls and means to register the withdrawn web lengths for proper pagination in justaposed head-to-foot relation, a knife and means to advance the registered webs to the knife along a first predetermined linear path where the webs are severed at a predetermined interval to produce a product of juxtaposed sheets, a first folder spaced laterally from said predetermined path for folding said product into a signature

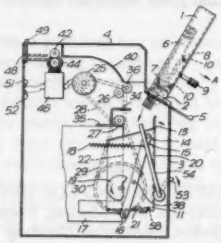
form of given dimension, transfer means including a transfer conveyor to transfer said product to the first folder, said transfer conveyor having a linear path diverging from said predetermined path, means to transfer the signature from the first folder to the gathering conveyor, a linear second transfer conveyor coaxial with said predetermined path and leading to a second folder for folding a signature to a different dimension, means to divert the juxtaposed sheet product emerging from said knife either to said first transfer conveyor or to said second transfer conveyor for delivery either to the first folder or to the second folder where the sheet product is folded into signature form, and signature delivery means to deliver the signature from the second folder to the gathering conveyor.

4,050,687

MICROFICHE HANDLING DEVICE

Harry Arthur Hele Spence-Bate, 1 Cheam Place, Morley, Australia (6062)

Filed Aug. 17, 1976, Ser. No. 715,180
Claims priority, application Australia, Aug. 20, 1975, 2858/75
Int. Cl.² B65H *5/22*
U.S. Cl. 271—3.1 **6 Claims**



1. A device for handling microfiches comprising a light proof container, reception means for receiving a microfiche cassette on or in the container including a light proof reception opening, a microfiche receiving chamber capable of receiving a stack of microfiches from the reception means, said chamber being pivotally mounted towards one end adjacent the reception means on one end of a lever which is pivotally mounted at its other end to a static part of the device, wherein the lever is biassed by means of a resilient means to engage with a cam, and wherein a fixed clamping surface is provided onto which the resilient means biasses the chamber to form a clamping means, the cam on rotation urging the chamber away from the clamping surface;

an ejection opening in the container including a light proof seal, extraction means for removing the microfiches singly from the chamber and feeding the microfiches singly to the ejection opening for ejection into a developing unit, said clamping means arranged to clamp a stack of microfiches held in the receiving chamber so that after a single microfiche has been removed from the stack for feeding to the ejection opening, the remainder of the stack is held in the chamber.

4,050,688

ORTHOGONAL DOCUMENT HANDLING APPARATUS

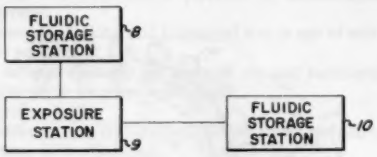
Klaus K. Stange, Pittsford; Richard E. Smith, Webster; Thomas J. Hamlin, Macedon, and James R. Cassano, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 15, 1976, Ser. No. 649,389
Int. Cl.² B65H *5/22*
U.S. Cl. 271—5 **12 Claims**

1. Document handling apparatus, comprising:

a. an exposure station including orthogonally related surfaces;

b. first means for fluidically moving a document in a first direction and into orthogonal registration with said surfaces of the exposure station, a registered document being entirely within the exposure station; said first means including a rack having a plurality of superposed pockets for storing documents, means for aligning each of the pockets with the exposure station, and fluidic means for



moving documents in aligned pockets to the exposure station; and

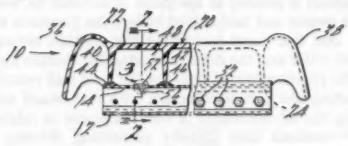
c. second means for fluidically moving said document in a second direction out of the exposure station; said first and second directions being transversely related.

4,050,689

PNEUMATIC FLEXIBLE BUMPER

David W. Barton, Birmingham, and George H. Muller, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 315,253, Dec. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 201,828, Nov. 24, 1971, Pat. No. 3,768,850, which is a continuation of Ser. No. 836,776, June 26, 1969, abandoned. This application Oct. 9, 1973, Ser. No. 404,580
Int. Cl.² B60R *19/10*
U.S. Cl. 293—71 P **5 Claims**



1. A resiliently deformable bumper assembly for a vehicle or the like comprising:

a rigid elongate backing member secured to the vehicle body,

a resiliently deformable elongate outer shell,

means securing said outer shell to the backing member,

said outer shell and said backing member forming an elongate enclosure,

said backing member having a front surface forming an inner wall of said enclosure,

a plurality of independent, uninterconnected partitions extending generally transversely to said outer shell and dividing said enclosure into a plurality of consecutive compartments,

said partitions being integrally formed with said outer shell and being integrally joined exclusively to said outer shell,

each of said partitions having an edge unattached to said outer shell positioned adjacent the front surface of said backing member,

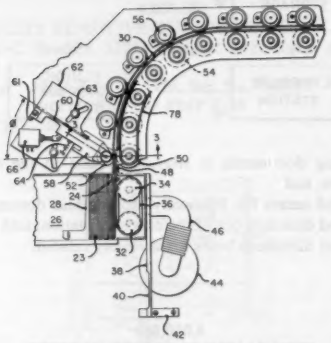
said unattached edge of said partition engaging the front surface of said backing member,

the portions of said partitions adjacent the unattached edges being resiliently deformed against said backing member to form seals therebetween and to place said partitions in compression between said outer shell and said front surfaces during normal unimpacted conditions.

4,050,690
DOCUMENT SEPARATOR MECHANISM

Gunnar P. Michelson, Van Nuys, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Sept. 16, 1976, Ser. No. 723,693
Int. Cl.[2] B65H 3/46
U.S. Cl. 271—125 10 Claims



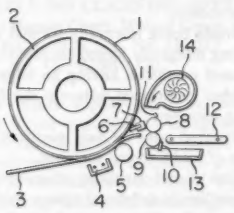
6. In document sorting apparatus having a document hopper, feed mechanism at one end of said hopper for initiating movement of documents from said hopper, and means for separating the documents in single manner prior to transporting thereof, said separating means including drive means adjacent said feed mechanism for advancing the documents, and

retard means cooperating with said drive means and having a braked retard roller juxtaposed said drive means, said retard means including arm means carrying said roller and pivotally supported distal from said retard roller and swingable from said drive means when more than one document is present at the point of contact between said drive means and said retard roller, the presence of more than one document increasing the friction between the retard roller and the document adjacent thereto and slowing the rotation of said retard roller, and said retard means including disc means rotatable with said retard roller for timing the advancement of one document in relation to a predetermined time thereby permitting driving of one document past said drive means and restraining an adjacent document by said retard means until one document has been advanced beyond said drive means.

4,050,691
SEPARATOR DEVICE IN A COPYING MACHINE

Yoshio Ito, Yokohama; Masao Ariga, Koma, and Masashi Suda, Irima, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 471,915, May 21, 1974, abandoned. This application Oct. 16, 1975, Ser. No. 622,857
Claims priority, application Japan, May 28, 1973, 48-62692
Int. Cl.[2] B65H 29/56
U.S. Cl. 271—124 4 Claims



1. A separator device in a transfer type copying machine for separating a transfer material from a surface of a rotating drum type photosensitive member after a visualized image on the surface of the photosensitive member has been transferred to the transfer material at an image transfer station, said separator device comprising:

a single stripping pawl having a blunt end which is stationary and which contacts an end portion of the surface of the photosensitive member at a position immediately after the transfer station, wherein said pawl contacts a leading end of the transfer material to cause a portion of the transfer material adjacent said leading end to buckle and subsequently curl away from said stripping pawl, thereby stripping said portion of the transfer material away from the surface of the photosensitive member;

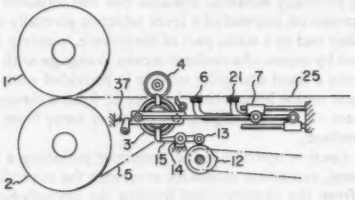
a pair of separating rollers disposed immediately downstream of said stripping pawl with respect to the direction of movement of the transfer material, for gripping the leading end of the transfer material after said curling movement thereof away from said pawl, said rollers rotating at the same peripheral speed as of the photosensitive member; and

means for cleaning peripheral surfaces of said rollers to remove unfixed toner deposited thereon.

4,050,692
SHEET FEEDING MACHINE

Josef Marass, Seehausen near Murnau, Germany, assignor to Georg Spiess GmbH, Gersthofen, Germany

Continuation-in-part of Ser. No. 531,684, Dec. 11, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,685
Claims priority, application Germany, July 18, 1974, 2434625
Int. Cl.[2] B65H 5/10
U.S. Cl. 271—267 6 Claims



1. In a device for feeding sheets to a fed machine, said device having stationary conveying rollers that rotate continuously at the same peripheral speed as receiving rollers of the fed machine and gripper devices which reciprocate toward and away from the conveying rollers, the improvement comprising:

A. crank means for driving the gripper devices from the conveying rollers in a reciprocating motion such that the gripper devices accelerate said sheets to about the peripheral speed of the conveying rollers; and

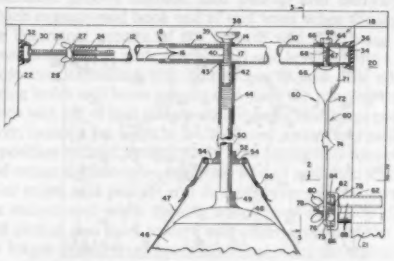
B. clutch means connected between the continuously rotating conveying rollers and the crank means for the reciprocating gripper devices for engaging said crank means in time sequence with said fed machine, said clutch means being actuated in said time sequence by a rotating cam driven in timed relationship with said fed machine and a cam follower having an end for contacting the rotating cam and an actuating end for mechanically actuating the clutch means, said cam follower being pivoted between said ends.

4,050,693

PUNCHING BAG AND SUPPORT MEANS FOR SUPPORTING SAME IN A DOOR FRAME AND THE LIKE TO PREVENT TWISTING OR TURNING OF THE SUPPORT MEANS

Noah Lichterman, Chicago, Ill., assignor to Martin Yale Industries, Inc., Chicago, Ill.

Filed Mar. 22, 1976, Ser. No. 669,097
Int. Cl.[2] A63B *69/22*
U.S. Cl. 272—78 7 Claims



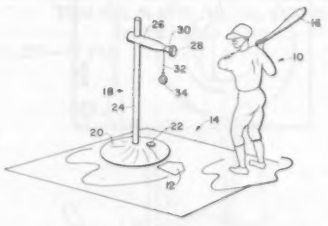
1. In combination, a punching bag and means for supporting same in a door frame having spaced apart vertical door jambs, said support means including a horizontally positioned and longitudinally adjustable means positioned between and supported by the door jambs, a punching bag supported on said support means, a rigid arm secured to said support means extending downwardly therefrom parallel to the adjacent door jamb, clamping means secured to said rigid arm substantially away from said support means and adapted to engage the opposite ends of the adjacent door jamb to prevent said support means from twisting or turning as said punching bag moves or vibrates back and forth, said clamping means being adjustable to adapt to door jambs of different dimensions between said opposite ends.

4,050,694

BATTING PRACTICE KIT

Raymond J. Domroski, 811 Spring St., Michigan City, Ind. 46350

Filed Mar. 10, 1976, Ser. No. 665,454
Int. Cl.[2] A63B *69/40*
U.S. Cl. 273—26 E 1 Claim



1. A baseball batting practice kit for use by a batter comprising:

a. a simulated playing surface;

b. said simulated playing surface having a simulated baseball home plate generally centrally located thereon;

c. said simulated surface further having at least two batter's boxes thereon spaced on opposite sides of said simulated baseball home plate;

d. a hollow base adapted to containing stablizing filler material;

e. said hollow base having a substantially flat bottom and said flat bottom being adapted to being placed upon one of said batter's boxes;

f. a substantially vertical column supported by and projecting upward from said hollow base;

g. a substantially horizontal arm having one of its ends cooperatively engaging said vertical column and adapted to being displaced into a plurality of vertical positions thereon;

h. means for locking said horizontal arm in one of said vertical positions;

i. a reduced-diameter neck region on said horizontal arm adjacent to its other end thereof;

j. a hollow ball;

k. a tether attached to said hollow ball at one end and having a loop at its other end;

l. said loop being adapted to passing over said other end of said horizontal arm whereby said hollow ball hangs suspended therefrom;

m. a clip on said tether adapted to reducing the dimension of said loop whereby said loop is freely retained in said reduced-diameter neck region and said tether and ball are enabled to rotate about the longitudinal axis of said arm; and

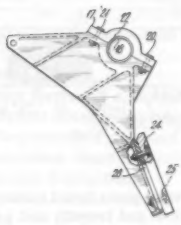
n. said horizontal arm being cooperative with said simulated playing surface whereby said ball is suspended over said home plate when said hollow base is positioned on the batter's box opposite the batter's box occupied by said batter.

4,050,695

FLEXIBLE PLANK SUPPORT UNIT

Thomas M. Camilleri, 277 Avenue W., Brooklyn, N.Y. 11226

Filed Feb. 24, 1976, Ser. No. 660,878
Int. Cl.[2] A63D *5/00*
U.S. Cl. 273—53 6 Claims



1. In a flexible plank support unit for an automatic pinsetting machine comprising a horizontal shaft, a pair of supporting arms fulcrumed on the horizontal shaft and a backstop attached to the bottom part of the supporting arms, the improvement which comprises forming each supporting arm of separate upper and lower portions, each portion having a channel, the two channels forming an opening to receive the shaft, the upper and lower portions being detachably secured to one another around the horizontal shaft, and cushioning means positioned between the shaft and the upper and lower portions of each supporting arm.

4,050,696

ARCHERY ARROW

Fernando Troncoso, Jr., 1851 S. Orange Ave., Monterey Park, Calif. 91754

Filed Aug. 17, 1976, Ser. No. 715,188
Int. Cl.[2] F41B *5/02*
U.S. Cl. 273—106.5 B 8 Claims

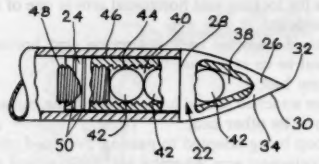
1. An improved archery arrow, said arrow comprising, in combination:

a. a hollow elongated arrow shaft bearing arrow vanes adjacent its rear end; and,

b. an arrow pile releasably secured to the front end of said arrow shaft, said pile comprising

i. an aerodynamically forwardly tapered down, dome-shaped hard point,

ii. a hollow pile tube connected to the rear end of said point and recessed inwardly thereof, said pile tube being releasably slideably disposed in said shaft front end so



that the leading edge of said shaft front end abuts the rear edge of said point to form a smooth, essentially continuous surface therewith, said pile tube being scored transversely and thus being readily breakable for shortening and lightening said tube, and

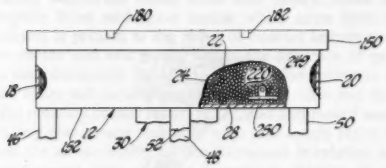
iii. control means for readily adjusting and positioning the weight of said pile to adjust the spine and balance of said arrow for fine tuning.

4,050,697

GAME AND GAME APPARATUS

John R. Purviance, 29530 Highmeadow Road, Farmington Hills, Mich. 48024

Filed Mar. 22, 1976, Ser. No. 669,203
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—139 **17 Claims**



16. A game comprising game board means, container means situated generally below and beneath said game board means, movable retrievable game article means situated within said container means, access aperture means formed through said game board means, generally dry and loose particle-like filler means within said container means obscuring the location of said retrievable game article means within said container means, said filler means being of a density different from the density of said retrievable game article means, and probe means employable by a player of said game for locating said obscured retrievable game article means and to attempt to retrieve said retrievable game article means through said access aperture means.

4,050,698

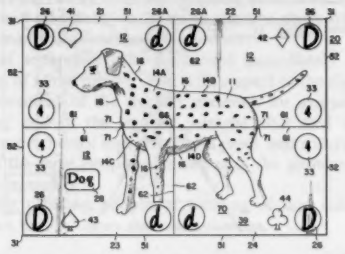
QUARTER CARD DECK

Albert Brown, Oakland, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Apr. 12, 1976, Ser. No. 675,722
Int. Cl.[2] A63F *1/00*
U.S. Cl. 273—152.41 **1 Claim**

1. A deck of playing cards for educational and play use, with each card of the deck formed of a uniform shape and marked on the face side of the card with a segment of a complete picture, with the cards marked as sets, in which each card of a set is marked with a different segment of a given complete picture, such that the complete picture is displayed when the cards of a set are aligned together to form a common pattern, in which each card is of a specific set of four cards, each card being of uniform rectangular shape, with each card marked on its face side with a quarter segment of a complete picture that is depicted when all four cards of a specific set are joined to form a common rectangle, with each set of four cards of the deck marked to display the figure of an animal, when assembled, with each specific set of four cards marked with a different picture, with

each card of a specific set being marked on its face side with a different suit symbol of a set of four suit symbols, with



each card of a specific set being marked with a common numerical sequential designation, said designation being individually different for each specific set of cards, such that

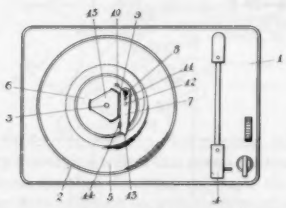
thirteen different specific sets of such cards may be employed to make up a deck of fifty-two cards that may be employed, in play, as a conventional deck of playing cards, for playing card games that involve four sets of individually sequentially identified cards with each set marked as a different suit, or alternately the cards may be employed for games that involve matching of the picture segments of four cards of similar or different specific sets.

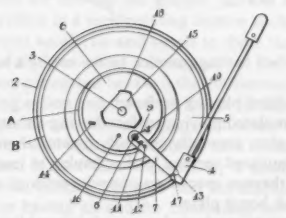
4,050,699

QUICK REPLAY DEVICE

Keijiro Sawano, Ohanachaya 3-25-7, Katsushika, Tokyo, Japan

Filed June 7, 1976, Ser. No. 693,133
Int. Cl.[2] G11B *17/06*
U.S. Cl. 274—15 A **2 Claims**





1. A quick replay device comprising a relatively small disk

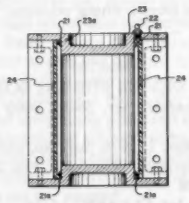
adapted to be situated on a turntable of a record player coaxially with a record which is situated beneath said disk, the latter having an outer periphery situated inwardly of the innermost groove of the record, said disk pivotally carrying a lever which is situated on top of said disk, and said disk having a stop while also carrying a spring which acts on said lever to urge the latter against said stop, and said lever when engaging said stop having a free hook end extending slightly beyond the outer periphery of said disk, the record player having a pickup arm which carries a stylus which when playing a record starts at an outer groove of the latter and progresses toward the innermost groove thereof, said pickup arm carrying a pin which engages said hook end of said lever when the stylus is at the innermost groove of the record, said disk being formed beneath said lever with a recess and said lever having a pointed projection extending into said recess of said disk when said spring holds said lever against said stop, the rotating turntable, when said pin of said pickup arm engages said hook end of said lever, causing the latter to be displaced away from said stop in opposition to said spring while said projection moves out of said recess and along an upper surface of said disk, so that said lever raises said pickup arm at said stylus thereof away from the record and while turning away from said stop displaces said pickup arm back toward said outer groove of the record, the length of said lever being such that when the stylus is again aligned with the outer groove of the record the hook end of said lever moves beyond said pin of said pickup arm so that the latter descends to again have its stylus situated in the outer groove of the record, while the separation of said lever from said pin of said pickup arm releases said lever to said spring to be returned thereby to a position engaging said stop, so that when the stylus again reaches the innermost groove of the record, the above operations will be automatically repeated whereby the record will be continuously replayed, the radial distance of the pivot axis of said lever from the axis of said disk and the distance from said pivot axis to said pointed projection being slightly greater than the radius of said disk, and said lever assuming a position when the stylus is situated over the outer groove of the record where said projection is situated slightly beyond said periphery of said disk, so that when the stylus is returned to the outer groove of the record not only does the hook end of the lever move beyond said pin of said pickup arm but also the projection becomes situated beyond the periphery of said disk so that the lever moves back down toward said disk to contribute also to the release of said lever by moving back down toward said disk when the stylus again engages the outer groove of the record.

4,050,700

SEAL HAVING FLUENT PACKING MATERIAL

Henry R. Lifferth, P.O. Box 57, Fortine, Mont. 59918

Filed Oct. 6, 1975, Ser. No. 619,698
Int. Cl.² F16J *15/10*
U.S. Cl. 277—72 FM **1 Claim**



1. A seal adapted to prevent flow between interconnected members, comprising

a pair of abutting members in face to face relationship;

a third member extending transversely to the junction between the pair of members and abutting said members;

a first groove extending fully between the pair of abutting members and another groove formed by a chamfered edge of one of said abutting members, said other groove being in communication with the first groove and in communication with the third member;

a fitting adapted to receive a liquid sealant under pressure;

means interconnecting the fitting and one of said grooves; and

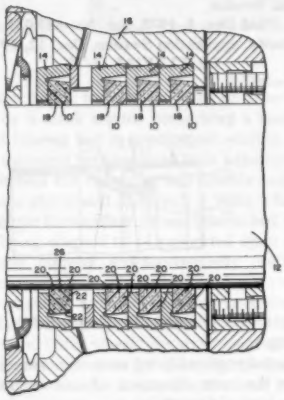
a liquid sealant injected through the fitting and filling said interconnected grooves.

4,050,701

FLUID SEAL

Paul Dale Webb, Tioga, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Nov. 26, 1976, Ser. No. 745,005
Int. Cl.² B65D *53/02*; C08F *28/00*
U.S. Cl. 277—125 **3 Claims**



1. A fluid seal, for fluid sealing a steel shaft having a given outside diameter, comprising:

a sealing element;

said element being formed of a moldable polymer material having a coefficient of expansion substantially equal to the coefficient of expansion of steel; and wherein

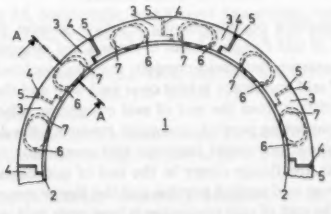
said element has carbon fibers and polytetrafluoroethylene particles dispersed therewithin.

4,050,702

SEGMENTED SEALING STRUCTURE

Antonio Del Matto, Brugg, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Apr. 13, 1976, Ser. No. 676,382
Claims priority, application Switzerland, Apr. 28, 1975, 5426/75
Int. Cl.² F16J *9/06*
U.S. Cl. 277—148 **5 Claims**



1. A packing ring structure for sealing two surfaces relative to each other comprising a pair of adjacently positioned ring components, each of said ring components being constituted by an assembly of ring segments provided with a projection at

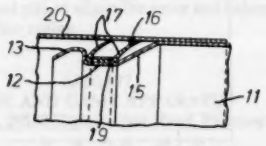
one end engaged with a complementarily configured recess at one end of an adjacent ring segment thereby providing a circumferentially extending interlocking of all the ring segments, said ring segments of the two ring components being staggered circumferentially relative to each other and each said ring segment being provided with at least one recess, the respective recesses in the segments of the two ring components being circumferentially aligned in face-to-face relation so as to form a circumferential array of slots, and pressure springs disposed in said slots.

4,050,703

TUBULAR CONNECTORS

Par-Ake Tuvesson, Bastad, and Carl-Gustaf Johansson, Angelholm, both of Sweden, assignors to Lindab, Lindhs Industri AB, Bastad, Sweden

Filed Dec. 2, 1975, Ser. No. 637,037
Claims priority, application Sweden, Dec. 12, 1974, 7415594
Int. Cl.[2] F16J *15/10*
U.S. Cl. 277—207 A **3 Claims**



1. A connector for joining to a hollow conduit, said connector comprising:

at least one end portion having an outer maximum dimension less than the inner dimension of said conduit to permit insertion into said conduit;

an anchoring portion of smaller dimension than said maximum dimension and spaced from the end of said connector;

an arched portion adjacent said anchoring portion on the side thereof facing the end of said connector, said arched portion being of greater dimension than said anchoring portion and of lesser dimension than said maximum dimension;

a connecting portion interconnecting and extending obliquely between said anchoring portion and said end portion; and

a lip seal mounted about the circumference of said anchoring portion and adapted to establish a seal between the outer side of said connector and the inner side of said conduit, said lip seal having a U-shaped cross section, the web of said U-shaped seal being held against said anchoring portion, the flanges of said U-shaped seal extending substantially parallel and radially outwardly from said anchoring portion beyond the maximum dimension of said connector;

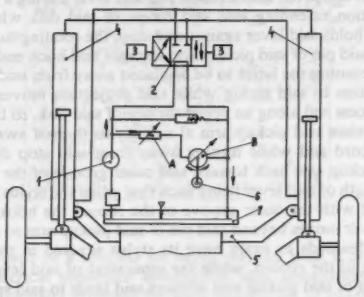
said connecting portion having a length greater than the height of said flanges of said U-shaped seal whereby upon axial insertion into said conduit, the flange closer to the end of said connector is bent over said web and the flange more distant from the end of said connector is bent over said connecting portion, and upon reversing the direction of relative movement between said connector and said conduit, the flange closer to the end of said connector is bent over said arched portion and the flange more distant from the end of said connector is bent over said web, said flanges remaining substantially parallel upon insertion, whereby an increase in pressure within said conduit makes more positive the seal between said connector and said conduit.

4,050,704

DEVICE FOR MAINTAINING AN UPRIGHT POSITION OF THE BODY OF A HARVESTER-THRESHER MACHINES

Mihail Duca; Dan Vasiliu; Teodor Demetrescu; Ion Cimpoias, all of Bucharest; Ion Linca, Bucharest-Otopeni; Stefan Breazu, Bucharest; Virgil Antonescu, Bucharest, and Iosif Cojocaru, Bucharest, all of Romania, assignors to Institutul de Cercetari si Proiectari de Masini Agricole-ICPMA, Bucharest, Romania

Filed Sept. 8, 1975, Ser. No. 611,256
Int. Cl.[2] B60S *9/10*
U.S. Cl. 280—6 R **10 Claims**



6. A device for maintaining the upright stance of the body of a harvester-thresher adapted to travel over irregular terrain, comprising:

a pendulum (6) swingably mounted on said body (5) for assuming different angular positions corresponding to two variations in the angular positions of the body (5) as the harvester-thresher travels over said terrain;

a flow controller (B) connected with said pendulum (6) and controlled thereby;

an adjustable valve (A) commanded by said flow controller (B);

an hydraulic fluid pump (1) connected hydraulically in circuit with said valve (A) and said flow controller (B), said flow controller (B) and said valve (A) bypassing a portion of the fluid delivered by said pump (1) in dependence upon the tilting angle of said body (5) of the harvester-thresher;

an electrically activated distributor (2) connected to said pump;

hydrostatic cylinders (4) connected to said body (5) of the harvester-thresher and hydraulically supplied through said distributor (2) with the remainder of the fluid delivered by said pump to displace said body (5) back into an upright position from a tilting position.

4,050,705

BRAKING DEVICE FOR SKI SCOOTERS

Philipp Kreis, Neumarkter Str. 34-36, 8000 Munich 80, Germany

Filed Mar. 1, 1976, Ser. No. 662,640
Claims priority, application Germany, Feb. 28, 1975, 2508814; Apr. 4, 1975, 2515838
Int. Cl.[2] A63C *17/14*
U.S. Cl. 280—11.1 BT **8 Claims**

1. In combination:

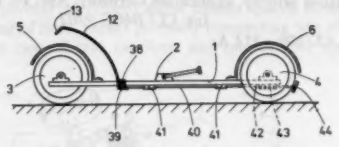
i. a ski scooter including:

a. a foot board having a front end and a rear end

b. a binding means on said footboard for securing one foot of a rider

c. first wheel means mounted rotatably on said footboard adjacent said front end

d. second wheel means mounted rotatably on said footboard adjacent said rear end
e. a brake element movably mounted on said footboard adjacent said rear end and positioned for braking said second wheel means
f. an element pivotted on said footboard at a position forward of said binding means

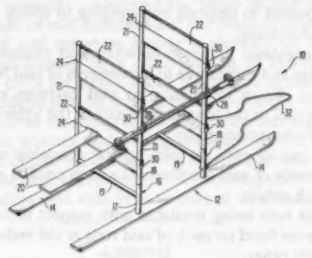


g. linkage means connected to said pivotted element and to said brake element, to permit actuation of said brake element by upward pulling movement of said pivotted element
h. means on said pivotted element for releasable engagement by a ski stick
ii. a ski stick having thereon engaging means for selectively engaging said releasable means on the pivotted element.

4,050,706
SKI CARRY

Rachel Kronstadt, 8781 Pierce Way No. 102, Arvada, Colo. 80003

Filed Apr. 22, 1975, Ser. No. 570,379
Int. Cl.[2] B62B *13/00*
U.S. Cl. 280—12 R **6 Claims**

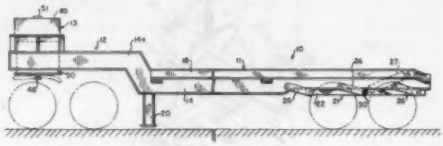


1. A modular tow device, adaptable to travel on snow, for the transportion of miscellaneous articles, comprising:
two parallel runner means for allowing the device to travel on snow;
a plurality of removable carrier means, each having depending posts; and
frame means attached to said runner means for receiving and holding each said removable carrier means in place, one at a time, said frame means comprising upstanding posts, each connected at one end thereof to one of said runner means and adapted to removably receive one of said depending posts of each said removable carrier means at the other end, said upstanding posts and said depending posts being in alignment and adapted to be removably secured together, and horizontal bars connecting upstanding posts on opposite runners, whereby the relative positions of said upstanding posts are assured,
wherein one of said removable carrier means is a rack means specifically adapted for carrying skis, said ski rack means comprising two supports each having said depending posts, and ski holders mounted between said depending posts of each of said supports, said ski holders on each of said supports being in alignment and adapted to hold skis to be transported by the tow device, and another of said removable carrier means is a container means for carrying packages, said package container means including a substantially horizontal floor portion on which the packages may be carried.

4,050,707
LIFTABLE BED TRUCK BODY CONFIGURATION FOR REMOVABLE STORAGE UNIT

Nick P. Glumac, Chesterton, Ind., assignor to Toter-Tee, Inc., Chesterton, Ind.

Filed Oct. 14, 1975, Ser. No. 622,104
Int. Cl.[2] B62D *21/18, 53/08*
U.S. Cl. 280—43.23 **2 Claims**



1. A variable height truck trailer adapted to be connected to and drawn by a truck tractor comprising a fixed bed and a liftable, load bearing bed in superposed relation to said fixed bed, means mounted between said beds adjacent to the rearward end thereof for elevating said liftable bed a predetermined distance above said fixed bed, a "fifth wheel" hitching mechanism at the forward end of said liftable bed, said hitching mechanism being adapted to be supported upon and attached to a generally circular and horizontally positioned "fifth wheel" mounting plate attached to said tractor body, said hitching mechanism including means extendible vertically between said plate and said liftable bed for initially matching the height of said "fifth wheel" for attachment of said hitching mechanism thereto and then for elevating the forward end of said liftable bed at the same time and to the same vertical extent as the rearward portion of the liftable bed is raised by the elevating means between the fixed and liftable beds, said vertically extendible means including inner and outer vertically telescoping extensible shells, one of which is connected to said "fifth wheel" plate and the other to said liftable bed, fluid actuation means to move said shells relative to each other, apertures defined respectively in the walls of said extensible shells adapted to be aligned horizontally when the forward end of said liftable bed is level with said rearward portion and the latter is resting upon said fixed bed and when the liftable bed is secured for the transport of loads in an elevated position above said fixed bed, a plurality of horizontally movable pins for insertion in said apertures when said apertures are in aligned relation to secure said shells in a predetermined vertically extended position, and means for actuating said pins when said apertures have come into aligned relation at a predetermined height position.

4,050,708
HAMPER AND CART

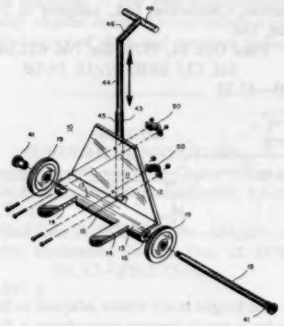
Momcilo M. Samardzija, and Cheryl Samardzija, both of Merrillville, Ind., assignors to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Apr. 12, 1976, Ser. No. 676,317
Int. Cl.[2] B62D *1/12*
U.S. Cl. 280—47.26 **2 Claims**

1. A cart on which a hamper may be mounted, formed of
a base plate bent at right angles to form a back section and a base section,
a telescopic handle asseembly mounted to the said back section of the base plate,
said base section formed from a substantially rectangular section of the base plate, with
a plurality of spaced flanges extending from the base plate, with each flange bent under the base plate about a com-

mon axis to form a closed circular tubular opening of the size to fit about an axle shaft,

said flanges separated by a plurality of spaced finger sections extending from the base section in the general plane of the base plate,



each said flange serving as a bearing support for a common axle shaft which shaft is fitted in the circular flange opeining, with

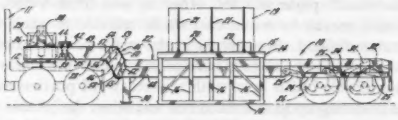
a wheel mounted to said axle shaft on each side of the base plate.

4,050,709

TRAILER DEFLECTOR RAMP

Eugene A. LeBoeuf, 9740 Mallery Drive, Noblesville, Ind. 46060

Filed Jan. 19, 1976, Ser. No. 650,355
Int. Cl.[2] B60P *1/02*
U.S. Cl. 280—106 T **6 Claims**



1. In a lift bed highway trailer adapted for coupling to a tractor by means of a fifth wheel connection, the combination comprising:

a. a liftable main frame having a lowered loading and unloading position and a raised transport position;

b. a subframe underlying said main frame;

c. a wheeled suspension underlying said subframe and adapted to serve as a ground support therefor;

d. a gooseneck fixed to the forward end of said main frame and adapted to connect same to the tractor;

e. a loaded pallet frame unit adapted to straddle said liftable main frame when the same is in lowered position and to rest freely upon said main frame when the latter is in raised transport position;

f. means for moving both the forward end portion and the rearward end portion of said main frame between the lowered loading and unloading position and the raised transport position; and

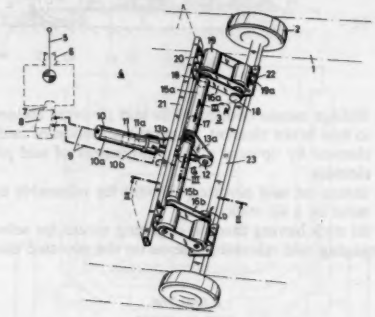
g. an inclined deflector ramp interposed between said gooseneck and the forward end of said main frame, said ramp being adapted to deflect the loaded pallet frame unit upwardly against the resistance of friction and gravity in event that the latter slides forwardly relative to the trailer under the impact of an emergency stop.

4,050,710

APPARATUS TO REDUCE THE EFFECT OF LATERAL FORCES DURING TURNS AND/OR ONE-SIDED LOADS ON PERSONS IN A VEHICLE

Heinz Flaig, Wetter, Germany, assignor to DEMAG Aktiengesellschaft, Duisburg, Germany

Filed Apr. 8, 1976, Ser. No. 674,838
Claims priority, application Germany, Apr. 10, 1975, 2515679
Int. Cl.[2] B60G *9/02*
U.S. Cl. 280—112 A **13 Claims**



1. Apparatus for reducing the tilting effect upon vehicles resulting from uneven loads and applied lateral forces in turning, comprising

a. a vehicle including a carriage and a chassis;

b. a dynamic feeler disposed on said vehicle, said feeler mounted to respond by swinging to tilting movements of said vehicle;

c. a regulator mounted between said chassis and said carriage and responsive to movements of said feeler for tilting said chassis in relation to said carriage around an axis parallel to the longitudinal axis of the vehicle; said regulator characterized by

d. a pair of rods on said vehicle rotatably mounted transversely of said longitudinal axis in coaxial alignment with each other;

e. said rods being rotatable with respect to each other;

f. a lever fixed on each of said rods at the ends thereof facing each other;

g. a reversible expanding and contracting device connected to said feeler;

h. one of said levers pivotally connected to one end of said expanding and contracting device and the other of said levers pivotally connected to the other end of said expanding and contracting device;

i. said levers being movable toward and away from each other in response to said expanding and contracting device for rotating said rods in opposite directions to each other;

j. a pair of lifting and lowering arms with one each fixed to one of said rods at the ends thereof opposite said levers; and

k. each of said pair of lifting and lowering arms pivotally connecting said chassis to said carriage for tilting one in relation to the other in response to said regulator.

4,050,711

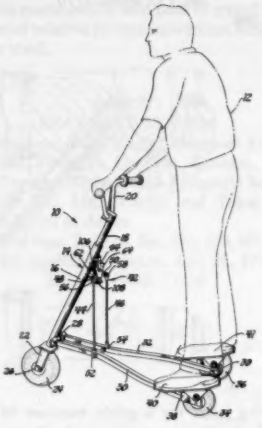
CAMBERING DEVICE FOR CAMBERING VEHICLE

Richard E. Denzer, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 28, 1976, Ser. No. 727,594
Int. Cl.[2] B60G *19/00*; B62K *15/00*
U.S. Cl. 280—278 **3 Claims**

1. In combination with a cambering vehicle having an upright steering frame provided with a pair of pivotally sup-

ported trailing arms, a mechanical cambering device for interconnecting the trailing arms so that they move in equal and opposite directions in parallel planes when the vehicle is leaned into a turn, said cambering device including a support member connected to said frame for pivotal movement about a first axis, a bell crank comprising a pair of members, pivot pin means mounting said members in said support member, each of said members supported by the associated pivot pin means for independent pivotal movement about an axis spaced from said first axis, a pair of links, means pivotally connecting one of said links between one of said members and one of said trailing



arms, means pivotally connecting the other of said links between the other of said members and the other of said trailing arms, each of said members having a plurality of openings formed therein located on a circle having its center at the center of said pivot pin means, a lock pin carried by the support member and adapted to be located in said openings formed in said members so as to selectively lock said members together in a first position wherein said trailing arms are located for normal operation of said vehicle and in a second position wherein said support member is prevented from pivoting about the first axis so as to allow said vehicle to be parked on a level surface.

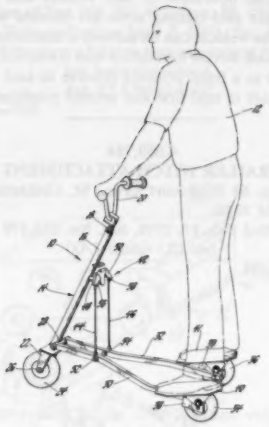
4,050,712

CAMBERING DEVICE FOR CAMBERING VEHICLE

Richard E. Denzer, Bloomfield Hills; Gerald J. Marsh, Warren, and Horacio Shakespear, West Bloomfield, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 28, 1976, Ser. No. 727,590
Int. Cl.[2] B60G *19/00*; B62K *15/00*
U.S. Cl. 280—278 **3 Claims**

1. In combination with a cambering vehicle having a steering frame provided with a pair of pivotally supported trailing arms, a mechanical cambering device for interconnecting the trailing arms so they move in equal and opposite directions when the vehicle is leaned into a turn, said cambering device including a support member connected to said frame for pivotal movement about a first axis, a bell crank comprising a pair of wing members carried by said support member for pivotal movement about a pair of laterally spaced axes which are parallel to said first axis, gear means interconnecting said wing members for coordinating pivotal movement thereof about said laterally spaced axes, a pair of links, means pivotally connecting one of said links between one of said wing members and one of said trailing arms, means pivotally connecting the other of said links between the other of said wing members and the other of said trailing arms, one of said wing members having three positioning means formed therein, a spring biased lock pin carried by the support member and adapted to cooperate with said positioning means formed in said one of said wing members so as to selectively lock said wing members together in a first position wherein said trailing arms are located for normal operation of said vehicle, and in a second positon wherein said trailing arms are located adjacent said frame for



stowing said vehicle in a minimum of space, and a third position wherein said support member is prevented from pivoting about the first axis so as to allow said vehicle to be parked on a level surface.

4,050,713

CAMBERING DEVICE FOR CAMBERING VEHICLE

Jerry K. Williams, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 28, 1976, Ser. No. 727,592
Int. Cl.[2] B62K *15/00*; B60G *19/10*
U.S. Cl. 280—278 **3 Claims**

1. In combination with a cambering vehicle having a steering frame the lower portion of which is provided with a pair of pivotally supported trailing arms, a mechanical cambering device for interconnecting the trailing arms so they move in equal and opposite directions when the vehicle is leaned into a turn, said cambering device including a bell crank comprising a pair of members mounted on said steering frame for pivotal movement about a common axis, a pair of equalizer links, means pivotally connecting one of said links between one of said members and one of said trailing arms, means pivotally connecting the other of said links between the other of said

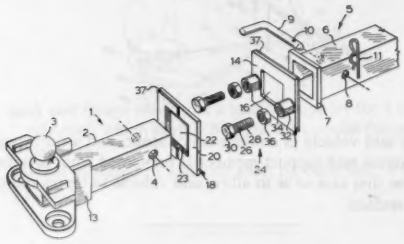
members and the other of said trailing arms, a first lock device carried by one of said members for securing said members together in a first position wherein said trailing arms are located for normal operation of said vehicle and in a second position wherein said trailing arms are located adjacent said frame so that the vehicle can be stowed in a minimum of space, and a second lock device carried by said frame for maintaining said bell crank in a fixed position relative to said frame when said members are in said first and second positions.

4,050,714

TRAILER HITCH ATTACHMENT

Walter H. Epp, 64 Highcourt Cres., St. Catharines, Ontario, Canada (L2M 3M6)

Filed Feb. 17, 1976, Ser. No. 658,479
Int. Cl.² G60D *1/00*
U.S. Cl. 280—495 **3 Claims**



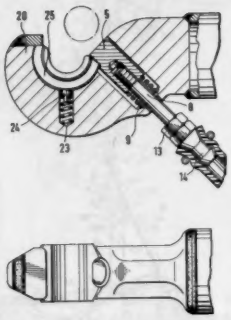
1. In combination a trailer hitch including a clevis pin, a trailer hitch head having a ball secured thereto and a shank extending therefrom, a trailer hitch drawbar having a hollow tubular member adapted to receive said shank and a clevis pin aperture adapted to receive said clevis pin locking said shank in said hollow tubular member such that said hitch head is removably coupled to said drawbar and a trailer hitch attachment for eliminating essentially all of the play in the coupling of said trailer hitch head to said trailer hitch drawbar; said attachment comprising a first plate provided with a first aperture of a shape and size to permit said shank to pass therethrough and a first skirt portion surrounding said first aperture, a second plate provided with a second aperture surrounded by a second skirt portion, said second aperture having a shape and size adapted to permit said shank to pass therethrough; a spacing means connecting said plates, said spacing means comprising first and second spacer members, each spacer member comprising a threaded bolt, a means for facilitating adjustment and a spacer member adjustor with a cooperating thread to threadably engage said bolt, each of said spacer members having a length which is adjustable by turning said bolt with respect to said spacer member adjustor; each of said spacer members having locking means for locking said bolt relative to said spacer member adjustor at a desired position so that a desired length of said spacer member is maintained; the arrangement being such that said first plate is secured on said drawbar such that said first plate cannot move with respect to said drawbar with said shank extending through said first aperture and said second plate is secured on said hitch head such that said second plate cannot move with respect to said hitch head with said shank extending through said second aperture and being removably secured in said hollow tubular member; said spacer members connecting said plates where said means for facilitating adjustment are exposed in a manner to allow adjustment of the spacer members by means of a tool; said spacer members being adjusted to space said plates such that said hitch head cannot move with respect to said drawbar while said shank is removably secured in said hollow tubular member by said clevis pin to eliminate essentially all the play in the coupling of said hitch head to said drawbar; said locking means adjusted to a position to maintain the desired adjusted length of said spacer members.

4,050,715

COUPLING HOOK FOR A GUIDE MEMBER OF A THREE-POINT ATTACHMENT OF A TRACTOR

Wilhelm von Allworden, Lohmar, Germany, assignor to Jean Walterscheid GmbH, Lohmar, Germany

Filed Oct. 8, 1976, Ser. No. 731,019
Claims priority, application Germany, Oct. 8, 1975, 2545040
Int. Cl.² B60D *1/10*
U.S. Cl. 280—508 **4 Claims**



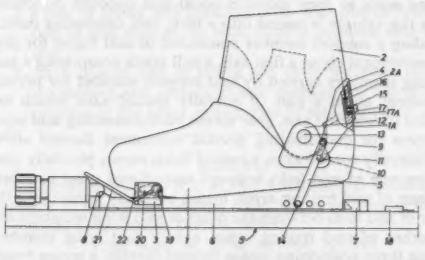
1. A coupling hook for a guide member of a three-point attachment of a tractor comprising a hook member having a hook opening, a partially spherical member having a slot to receive a coupling pin on an implement to be coupled and pivotally mounted within said hook opening, a latch displaceable into said hook opening to block a coupling pin in said partially spherical member slot in the locked position and displaceable into an open position, means on a portion of said hook opening opposed from said latch for defining a fulcrum for said partially spherical member, a first spring between said hook member and said partially spherical member and spaced from said fulcrum means urging said partially spherical member towards said latch, and means on said latch engageable with a portion of said partially spherical member for maintaining said latch in its open position.

4,050,716

SKI BINDING

Axel Kubelka, and Gottfried Schweizer, both of Vienna, Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Mar. 19, 1976, Ser. No. 668,572
Claims priority, application Austria, Apr. 2, 1975, 2499/75
Int. Cl.² A63C *9/086*
U.S. Cl. 280—614 **13 Claims**



1. In a ski binding comprising a sole plate releasably secured to a ski and having a ski boot secured to said sole plate by a

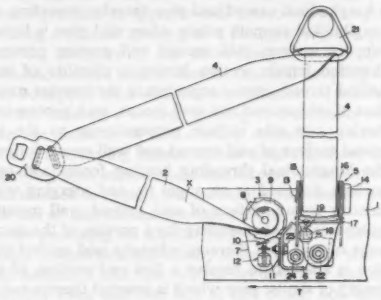
front support and a heel holding assembly, the improvement comprising a ski boot having a lower shell with a raised rear wall and an ankle cuff pivotally secured to said shell to allow pivotal movement of said ankle cuff in response to shifts in the weight of an individual using the boot, said cuff in part overlying said rear wall, said rear wall having an upper edge which is in the path of travel of the lower edge of the cuff so as to define a rearmost pivoted position on the cuff, said heel holding assembly, in the position of use, having first means engaging said lower shell to hold the boot heel to said sole plate, said heel holding assembly having second means including a stop member thereon positioned in said path of travel of said cuff to limit the degree of relative pivotal movement between said cuff and said lower shell.

4,050,717

SEAT BELT SYSTEM

Makoto Yamada, Seto; Shiro Sasaki; Shigenori Kanazawa, both of Toyota, and Yoshihiro Hayashi, Kasugai, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota; Nippon Denso Co., Ltd., Kariya and Tokai Rika Denki Seisakusho K.K., all of Japan

Filed Apr. 7, 1976, Ser. No. 674,491
Claims priority, application Japan, Apr. 25, 1975, 50-51147
Int. Cl.² B60R *21/10*
U.S. Cl. 280—744 **1 Claim**



1. A seat belt system comprising:

a lap belt;

a lap belt take-up device, said device including a vehicular speed-sensing type emergency lock retractor having a belt winding shaft mounted on a car body frame member horizontally and substantially orthogonal to the traveling direction of the vehicle, one end of said lap belt being connected to said shaft;

a shoulder belt;

a shoulder belt take-up device, this device including a vehicular speed-sensing type emergency lock retractor having a belt winding shaft mounted on a car body frame member horizontally and substantially in parallel with the traveling direction of the vehicle, one end of said shoulder belt being connected to said shaft of said shoulder belt take-up device;

a guide ring, which is attached to a car body frame member in the vicinity of an outer shoulder of an occupant and through which said shoulder belt is inserted;

a tongue plate, to which the other end of said lap belt is connected and the other end of said shoulder belt is also connected through said guide ring and which is disengageably engaged with a buckle member anchored to a car body frame member on a side opposite to the retractors with respect to a seat; and

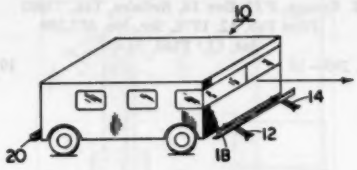
a retractor fixing bracket, which is substantially L-shaped, said lap belt and shoulder belt take-up devices being secured to respective arms of the L-shape and the bracket being secured to a car body frame member.

4,050,718

VEHICLE LEVELER SYSTEM

C. Lewis Newcomb, Jr., 520 11th Ave., Haddon Heights, N.J. 08035

Continuation of Ser. No. 316,472, Dec. 19, 1972, Pat. No. 3,881,746. This application May 5, 1975, Ser. No. 574,373
The portion of the term of this patent subsequent to May 6, 1992, has been disclaimed.
Int. Cl.² B60S *9/02*
U.S. Cl. 280—763 **7 Claims**



1. A leveler system for an over-the-road vehicle having a spring-suspended frame comprising in combination with said vehicle:

a plurality of jack devices each having an individually adjustable length, a lower ground-engaging portion on each said device,

and means for pivotally securing the upper portion of each said jack device to the spring-suspended frame of the vehicle adjacent a different corner thereof,

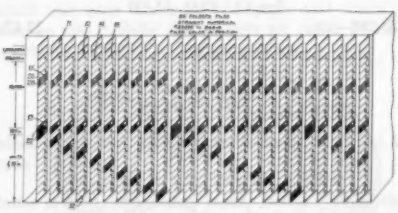
so that said vehicle can be partially elevated for leveling various individual amounts at each corner by driving the vehicle to move the jack devices in the direction of movement of said vehicle for rotation of the lengths thereof to a vertical condition supporting said vehicle frame and with a partial extension of the spring frame of said vehicle and the vehicle wheels resting on the ground, and so that said vehicle can be restored to normal over-the-road condition by driving the vehicle to rotate said jack devices for the lengths thereof to be inclined to the vertical with said vehicle frame fully spring suspended.

4,050,719

COLOR CODED INDEXING SYSTEM

Walter F. Cunningham, 183 W. Walnut Ave., Des Plaines, Ill. 60016

Filed Aug. 24, 1976, Ser. No. 717,164
Int. Cl.² B41F *21/00*
U.S. Cl. 283—36 **10 Claims**



1. A color coded indexing system to facilitate filing and retrieval of documents, comprising two ten-position digital bars spaced longitudinally from each other on and adjacent an edge of each document and each successively displaying in its 10 positions the numerals 0–9, 10 sets of color coded single digit tabs with each set displaying one of the numerals 0–9 and having a different color and each said tab having a transparent

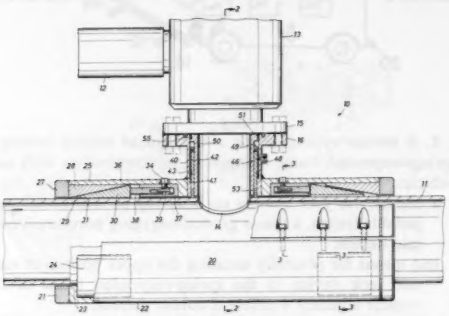
portion adjacent to and aligned with the said numeral thereon, and means for adhering selected said tabs to a document over said bars, whereby said transparent portion of a said tab adhered to a document over a said bar in any digital position thereof will overlie the digit in that position to transform said single digit tab into a double digit tab to provide a proper identification of the particular number of said document and proper filing of documents so identified will establish a color coded set position pattern for any desired filing system.

4,050,720

HOT TAP FOR PIPELINE

Bobby J. Reneau, P.O. Box 14, Bellaire, Tex. 77401

Filed Feb. 12, 1976, Ser. No. 657,356
Int. Cl.² F16L *35/00*
U.S. Cl. 285—18 **10 Claims**



8. The apparatus of claim **1** including

a cavity means in said laterally directed connective means, and wherein said piston is fluidly actuated within said cavity;

transverse head means closing said cavity at one end of said cavity; and

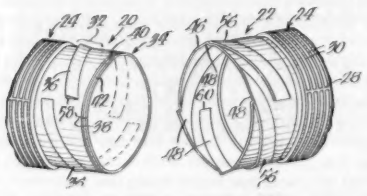
duplicate pipe gripping means in said housing, one arranged upstream and the other arranged downstream of said laterally directed connective means, each of which slidably engages the main pipeline and which are constructed nd arranged to work against one another in creating an axial load on gripping the pipe.

4,050,721

REINFORCED PLASTIC PIPE

Kenneth F. Streit, Mount Prospect, Ill., assignor to Phone-Ducs, Inc., North Chicago, Ill.

Filed June 9, 1976, Ser. No. 694,180
Int. Cl.² F16L *35/00*
U.S. Cl. 285—93 **32 Claims**



1. A length of plastic pipe comprising:

a first end portion, a middle portion, and a second end portion,

said middle portion having middle wall means for forming a passageway, a plurality of integral, exterior peripheral reinforcing flanges disposed at spaced intervals along the length of said middle wall means to provide stiffening, and a plurality of integral, longitudinal reinforcing ribs disposed at spaced intervals about the exterior of said middle wall means to provide stiffening, the height of said peripheral flanges being equal to the height of said longitudinal ribs,

said first end portion having a first end tubular wall of generally annular transverse cross-section and presenting a threaded male section having a plurality of protuberant helical thread rib segments on the exterior of said tubular wall, each rib segment having one side surface perpendicular to the exterior surface of said first end tubular wall for carrying the longitudinal threading bearing forces and one side surface disposed at an angle to, and merging with, the exterior surface of said first end tubular wall, each rib segment extending for a portion of the circumference of said wall thereon, said first end portion further having, between the distal end thereof and said threaded male section, a cylindrical end portion containing an annular groove in the exterior surface of said tubular wall and having a resilient gasket disposed within said annular groove,

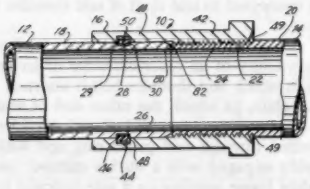
said second end portion having a second end wall means for forming an internal passageway of generally round transverse cross-section, a part of the exterior surface of said second end portion and the edges of parts of said circular flanges and longitudinal ribs lying along a line parallel to a longitudinal axis of said pipe thereby providing aligned longitudinal support points when said pipe is layed on a support surface, said second end portion presenting a threaded female section having a plurality of indented helical thread groove segments in the interior round surface of said second end wall means, each groove segment having one side surface perpendicular to the interior round surface of said second end wall means for carrying the longitudinal threading bearing forces and one side surface disposed at an angel to, and merging with, the interior round surface of said second wall means, each groove segment extending for a portion of the circumference of said wall thereon, whereby said second end portion is adapted to receive a first end portion of another length of similar pipe which is inserted therein and turned for causing threading engagement between the threaded male and female sections to establish a connection therebetween.

4,050,722

JOINT FOR CONDUIT

Sidney Berger, Great Neck; Salvatore Buda, East Hills, and Burton Weintraub, Old Bethpage, all of N.Y., assignors to Berger Industries, Inc., Maspeth, N.Y.

Filed Oct. 14, 1975, Ser. No. 621,834
The portion of the term of this patent subsequent to Oct. 5, 1993, has been disclaimed.
Int. Cl.² F16L *19/00*
U.S. Cl. 285—175 **8 Claims**



1. In combination:

a. a first two-ended conduit section having a length which equal to at least four times its outer diameter with a circular cylindrical outer wall surface of a constant diameter

extending substantially the entire length of said conduit section and an axial passage of constant cross-sectional dimensions and configuration, one end of said first conduit section having external thread means thereon and a flat substantially perpendicular end face, the outside diameter of said thread means not exceeding said constant diameter, and said other end of said first conduit section being non-threaded and having a flat substantially perpendicular end face;

b. a second two-ended conduit section identical to said first conduit section having a length which is equal to at least four times its outer diameter, having a circular cylindrical outer wall surface of a constant diameter extending substantially the entire length of said conduit section, said outer wall surface equal in diameter to said outer wall surface of said first conduit section and an axial passage of constant cross-sectional dimensions and configuration equal to said axial passage through said first conduit section, one end of said second conduit section having external thread means thereon with a flat substantially perpendicular end face matching and abutting said adjacent flat substantially perpendicular end face of said other non-threaded end of said first conduit section, the outside diameter of said thread means not exceeding said constant diameter, and said other end of said second conduit section being non-threaded and having a flat substantially perpendicular end face;

c. a coupling sleeve having an end face and having first and second portions on opposite ends thereof, said first portion defining a central opening of a diameter slightly greater than the diameter of the entire length of said circular cylindrical outer wall surface so that said coupling sleeve may be slipped onto said first conduit section, said second portion defining a central opening of a diameter smaller than the diameter of said circular cylindrical outer wall surface and having female thread means formed therein extending from adjacent said end face and constructed and dimensioned to engage said external thread means on said one end of said second conduit section;

d. means providing an annular lock ring groove having an axially inward side and axially outward side in said outer wall surface of said first conduit section, near and spaced inwardly from said end face at said other, non-threaded end;

e. means providing an annular lock ring groove on the inner surface of said coupling sleeve in said first portion; and

f. at least one resilient lock ring of a variable diameter received partially within each of said annular lock ring grooves in its unbiased condition, a said annular lock ring groove having a depth at least equal to the cross-sectional height of said at least one lock ring;

g. at least one of said first portion of said coupling sleeve and said other end of said first conduit section provided with camming means to urge said lock ring fully into said annular lock ring groove when said coupling sleeve is first moved axially inwardly on said first conduit section, said lock ring in its unbiased condition spanning said annular lock ring grooves thereby captively holding said coupling sleeve on said first conduit section to form a coupling sleeve and conduit section unit and permitting rotation of said coupling sleeve on said first conduit section so that said coupling sleeve can be threaded onto said end of said second conduit section so as through said lock ring to force said end faces of said first and second conduit sections together;

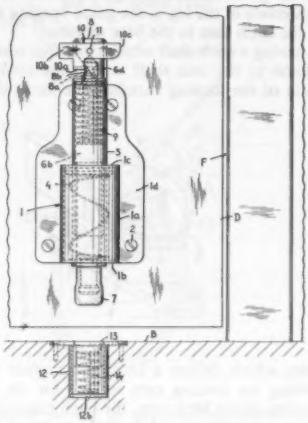
h. said central opening defined by said first portion being dimensioned to create a clearance between said first portion and said outer wall surface of said other non-threaded end of said first conduit section to thereby permit swivelling of said coupling sleeve on said non-threaded end of said first conduit section so that said female thread means on said coupling sleeve can mate with said external thread means on said other end of said second conduit section when said first and second conduit sections are not in exact axial alignment.

4,050,723

MECHANISM FOR SECURING A DOOR IN OPEN OR CLOSED POSITION

George Papadatos, 703 6th Ave., Asbury, Park, N.J.

Filed Dec. 3, 1976, Ser. No. 747,184
Claims priority, application Greece, May 17, 1976, 50740
Int. Cl.[2] E05C *1/02*
U.S. Cl. 292—164 9 Claims



1. Mechanism for securing a door in open or closed position comprising a casing having vertically aligned openings, means for securing the casing to a door near the floor, a hollow cylinder received in said openings of the casing and guided by said openings for vertical lengthwise movement relative to the casing, first spring means for biasing said cylinder upwardly relative to the casing, means for limiting upward movement of said cylinder relative to the casing to position said cylinder in an upper position, a plunger received in said cylinder and longitudinally movable therein, second spring means for biasing said plunger downwardly relative to said cylinder, detent means on the upper end of said plunger, latch means on the upper end of said cylinder engageable with said detent means on the upper end of said plunger to hold said plunger in an upper position, means for manually releasing said latch means whereupon said plunger is pressed downwardly into engagement with the floor by said second spring biasing means, said cylinder being manually movable downwardly relative to said casing and said plunger from said upper position to a position in which said latch means again engages said detent means whereupon said cylinder and plunger are raised by said first spring biasing means to said upper position.

4,050,724

SASH LOCK

Yoshitaka Nakanishi, 12-9, Yawata 5-chome, Ichikawa, Chiba, Japan

Filed Dec. 4, 1975, Ser. No. 637,656
Claims priority, application Japan, Dec. 27, 1974, 49-1248; Dec. 27, 1974, 49-1249
Int. Cl.[2] E05C *3/04*
U.S. Cl. 292—241 11 Claims

1. A sash lock, comprising:

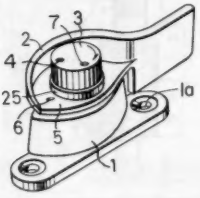
a base member;

a latch cam having a latch cam shaft for rotatably mounting the latch cam on the base member;

a locking member for unlockably locking the latch cam against rotation thereof on the base member, the locking

member having a cylindrical body portion which coaxially surrounds the cam shaft and is shiftable along the same in one direction for locking and in an opposite direction for unlocking the latch cam, the locking member also having a leg, which projects from one end of the cylindrical body portion, and having means defining a locking cam surface which projects from another end of the cylindrical body portion, the latch cam having a guide opening to guide the leg of the locking member in the locking and unlocking of the latch cam, and the base member having a recess which can be aligned with the guide opening by rotation of the latch cam on the base member to permit, when the guide opening is aligned with the recess, reversible insertion of the leg in the guide opening and recess to lock the latch cam to the base member;

a knob having a knob shaft which coaxially, rotatably pivots the knob to the cam shaft and to the cylindrical body portion of the locking member, the knob also having a



portion which defines a knob cam surface conformably matching the locking cam surface for the locking and unlocking of the latch cam, the knob cam surface and the locking cam surface each having a recessed flat cam portion, a projecting flat cam portion, and an inclined cam portion interconnecting the flat cam portions, and the flat cam portions being normal to the shaft; and

a spring on the base member and latch cam, urging the locking member against the knob cam surface;

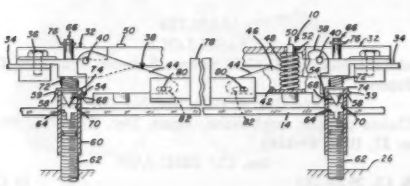
whereby, when the recessed flat portion of the knob cam surface and the projecting flat portion of the locking cam surface are mutually engaged, the spring shifts the locking member in the direction for unlocking; and when the projecting flat portions of both surfaces are mutually engaged the spring is counteracted thereby, the locking member is shifted in the direction for locking, and the leg is inserted in the recess, locking the latch cam to the base member.

4,050,725

LATCH ASSEMBLY

William Crawford Wilson, and David Bowen Anderson, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 29, 1976, Ser. No. 671,531
Int. Cl.² E05C *21/00*
U.S. Cl. 292—304 **5 Claims**



1. Latching assembly for selectively latching and accurately positioning a frame relative to a frame support, said frame and said frame support being biased from a latched position toward a separated position, said assembly comprising:

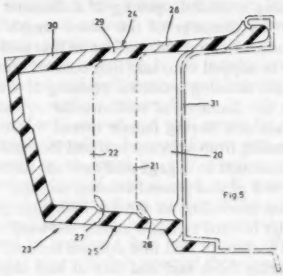
at least one pawl pivotably mounted on said frame, said pawl having a latching surface for latching said frame to said frame support; means to bias said pawl to a latched position; means connected to said pawl for selectively moving said pawl to an unlatched position; at least one guide pin mounted on said frame for extensible movement relative thereto, resilient means for urging said pin to a position extending from said frame, a positioning flange fixed to said guide pin; at least one latching post fixed to said frame support, said latching post having a recess sized for matingly receiving said one guide pin for laterally positioning said frame relative to said support when said members are moved toward their latched position and further having an adjustable shoulder, said shoulder having a first surface engageable by said positioning flange and a second surface engageable by said latching surface of said pawl when said frame is in its latched position relative to said frame support whereby said frame is securely latched and accurately spatially positioned relative to said frame support.

4,050,726

ENERGY ABSORBING BUMPER

Hermann Hablitzel, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Germany

Filed Apr. 30, 1976, Ser. No. 681,818
Claims priority, application Germany, May 9, 1975, 2520594
Int. Cl.² B60R *19/06*
U.S. Cl. 293—71 R **8 Claims**



1. An energy absorbing bumper for protecting an object from damage from an impact, comprising a support mounted to said object, an elastic base member, arranged opposite said support, and at least two elastic sidewalls extending between said base member and said support, said sidewalls having a first cushion zone adjacent said support and a second cushion adjacent said base member, the wall thickness of said sidewalls being greater in said second cushion zone than in said first cushion zone, the material characteristics and wall thickness of said first and second cushion zones being selected so that a selected impact occuring at temperatures near or above room temperature will cause deformation of said first cushion zone with substantially no dissipation of impact energy and deformation of said second cushion zone with substantial impact energy dissapation, and said selected impact occuring at lower temperature will cause deformation of said first cushion zone with substantial impact energy dissapation and will cause substantially no deformation of said second cushion zone.

4,050,727

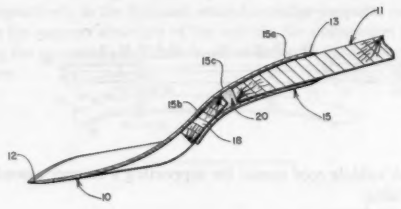
HAND-SHOVEL ASSEMBLY AND METHOD OF PRODUCING IT

David R. Bonnes, Columbus, Ohio, assignor to The Union Fork & Hoe Company, Columbus, Ohio

Filed Aug. 10, 1976, Ser. No. 713,113
Int. Cl.² A01B *1/22*; B25G *3/34*
U.S. Cl. 294—49 **12 Claims**

1. A hand implement comprising a head and an elongated

handle; said head having a continuous socket formed thereon with an outwardly opening handle-receiving end and an opposite outwardly-opening plug-receiving end, a handle having a portion inserted into the handle-receiving end of the socket to fit tightly therein adjacent the socket outer end but to provide a space around the inserted handle portion within the socket, a plug having a portion inserted into the plug-receiving end of the socket to fit tightly therein adjacent the socket outer end but to provide a space around the inserted plug portion within the socket, said plug inserted portion and said handle inserted



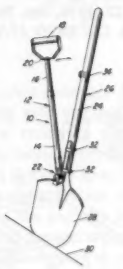
portion having inner extremities spaced from each other to provide a chamber therebetween which communicates with the respective spaces around the inserted portions of the plug and handle, said chamber and said spaces being filled with a body of solid bonding material which is of substantially H-form in axial cross-section that bonds to the surrounding socket and the inserted plug and handle portions to substantially integrally connect the plug and handle portions together within the socket and cause them to tightly fit within the socket.

4,050,728

SECOND HANDLE FOR ATTACHING TO A SHOVEL OR THE LIKE

Glenn E. Davidson, 205 Franklin, Sublette, Kans. 67877

Filed Oct. 12, 1976, Ser. No. 731,465
Int. Cl.² B25G *3/00*
U.S. Cl. 294—58 **4 Claims**



1. A second handle for attaching to a shovel or the like, the second handle comprising:

an elongated tube having a first end portion and a second end portion;

a hand grip attached to the second end portion of said tube for holding the second handle; and

a universal joint, attached to the second end portion of said tube and attached to the shovel for pivoting said tube on the shovel, said universal joint pivoting said tube in a plane parallel to the plane of the shovel, and pivoting said tube in a plane perpendicular to the plane of the shovel, said universal jont including:

a "J" shaped mounting strap, said mounting strap attached to the shovel by annular clamps; p1 a swivel rotatably mounted between the "J" shaped portion of said mounting strap; and

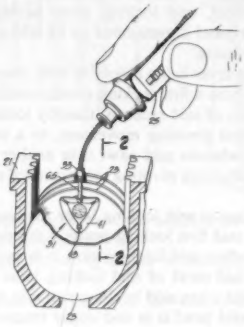
a pair of strap arms, one end of said strap arms pivotally attached to said swivel, the other end of said strap arms secured to the second end portion of said tube.

4,050,729

APPARATUS FOR HANDLING DELICATE ARTICLES SUCH AS SILICON WAFERS

Clifford L. Hutson, 1860 Idlewood Road, Glendale, Calif. 91202

Filed Apr. 20, 1976, Ser. No. 678,469
Int. Cl.² B66C *1/02*
U.S. Cl. 294—64 R **19 Claims**



1. Apparatus for picking up and handling silicon wafers and the like, comprising:

a rigid housing configured to be movable edgewise between closely adjacent wafers;

means in said housing defining an open vacuum chamber which terminates in a deflectable surface-contacting peripheral lip extending adjacently over a side face of the housing; and

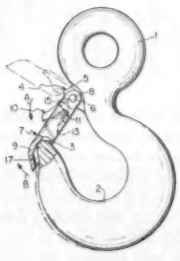
means in said housing, connectable to a vacuum source and extending into said vacuum chamber in a plane substantially parallel to the plane including said lip, for generating a vacuum in said vacuum chamber.

4,050,730

HOOK LATCHING DEVICE

Akio Tada, 2-7, Mondohigashino-cho, Nishinomiya, Hyogo, and Hideyuki Torihata, 7-7, 1-Chome, Ohmiya, Asahi, Osaka, both of Japan

Filed May 19, 1976, Ser. No. 688,077
Int. Cl.² B66C *1/36*
U.S. Cl. 294—82 R **2 Claims**



1. In a hook assembly of the type including a hook having a hanger or shank portion, a curved portion with a tip end, and an opening through which a looped rope or wire is movable;

and a latching device for closing said opening; the improvement wherein said latching device comprises:

a bracket on said hanger portion of said hook adjacent said opening, said bracket having upper and lower surfaces with upper and lower recesses, respectively, therein;

a latching arm pivotally connected at a first end thereof to said bracket, said latching arm having adjacent a second end thereof a cap adapted to contact and receive said tip end of said hook;

said latching arm being pivotable from a closed position blocking said opening with said cap contacting said tip end to an open position opening said opening with said cap spaced from said tip end;

a locking lever pivoted to said latching arm interiorly thereof and at a position between said first and second ends thereof, said locking lever having at a first end thereof a pawl dimensioned to fit within said upper and lower recesses;

said locking lever being pivotable with respect to said latching arm from a first locking position wherein said pawl is within one of said recesses, thereby locking said latching arm against pivoting movement, to a second unlocking position wherein said pawl is in neither of said recesses, thereby allowing pivoting movement of said latching arm; and

means acting on said locking lever for biasing said locking lever to said first locking position thereof;

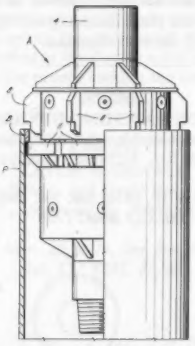
whereby, when said latching arm is in said closed position thereof said pawl of said locking lever is in said lower recess, and when said latching arm is in said open position thereof said pawl is in said upper recess.

4,050,731

SHIFTING APPARATUS

Malcolm G. Coone; Billy C. Malone, and Marvin Lee Holbert, Jr., all of Houston, Tex., assignors to Lynes, Inc., Houston, Tex.

Filed Jan. 26, 1976, Ser. No. 652,175
Int. Cl.² B66C 1/42
U.S. Cl. 294—86.24 **8 Claims**



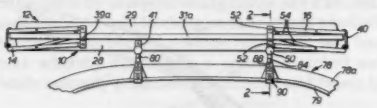
1. Apparatus for at least partial insertion within a longitudinally shiftable element, comprising: a longitudinally extending housing; an inflatable device within said housing; means communicable with said inflatable device for selective control of fluid pressure within and manipulation of said inflatable device; control elements within said housing selectively operational to expanded and retracted positions in response to said inflatable device; means on said housing for locking said control elements into expanded position, at least part of said elements when in the expanded position extending out of and away from said housing, said elements when in the expanded position engaging said shiftable element and governing longitudinal movement thereof, said elements when in the retracted position disengaging said shiftable element.

4,050,732

CAMPER ASSEMBLY

Gerard Connor MacIsaac, 17 McCubbin Street, Burwood, Victoria, Australia

Filed Feb. 2, 1976, Ser. No. 654,509
Claims priority, application Australia, Feb. 11, 1975, 554/75
Int. Cl.² B60P 3/34
U.S. Cl. 296—23 A **15 Claims**



15. A vehicle roof mount for supporting a camper assembly comprising:

a carry frame;

means to detachably mount the frame on the cabin roof of a vehicle;

respective spaced sets of prongs for engaging the collapsed assembly along respective sides thereof and so retaining it on the carry frame, one set of which prongs being withdrawable to release the assembly; and

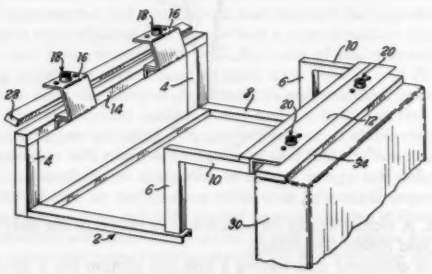
a pair of pads on which to rest the assembly during lifting of the latter onto or from the carry frame, which pads define respective pad surfaces for engaging an underside of the assembly and are so mounted that the pads are freely rotatable about each of two mutually perpendicular axes, rotation about one axis being effective to move the pad surfaces between an upwardly facing condition just above and to one side of the carry frame and a condition in which they face laterally outwardly of the frame.

4,050,733

VEHICLE CAB

James L. Borrill, Doncaster, England, assignor to International Harvester Company, Chicago, Ill.

Filed Jan. 23, 1976, Ser. No. 651,984
Int. Cl.² B62D 27/04
U.S. Cl. 296—28 C **10 Claims**



1. A cab sub-frame for a vehicle having a support structure, the sub-frame comprising first and second pairs of longitudinally and laterally spaced apart upright beam elements having upper and lower ends, a pair of lower longitudinally extending beam elements adapted to carry a floor, the lower beam elements having opposite ends connected to the lower ends of the first and second pairs of upright beam elements, a pair of upper longitudinally extending beam elements adapted to carry on operator's seat, the upper beam elements having a first end connected to the upper ends of the second pair of upright beam

elements and a second end extending longitudinally therefrom, a first crossbar extending between and connected at the opposite ends thereof to the upper ends of the first pair of upright beam elements, a second crossbar parallel to the first crossbar and extending between and connected at the opposite ends thereof to the extending second ends of the upper beam elements, first and second crossbar supports longitudinally spaced and mounted to the support structure, first and second resilient mountings respectively carried by the first and second crossbars, and connecting means for connecting the first and second resilient mountings carried by the first and second crossbars respectively to the first and second crossbar supports mounted on the support structure of the vehicle, the connection insulating the mounted sub-frame from vibration in the support structure.

4,050,734

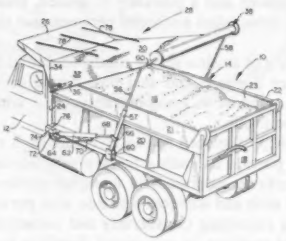
ROLL-UP TRUCK COVER ASSEMBLY

Douglas B. Richard, 17 Vine St., Ansonia, Conn. 06401

Continuation of Ser. No. 490,252, July 22, 1974, abandoned, and a continuation-in-part of Ser. No. 272,668, July 17, 1972, abandoned. This application Oct. 17, 1975, Ser. No. 623,446

Int. Cl.[2] B60P *7/04*

U.S. Cl. 296—98 **19 Claims**



1. A roll-up truck cover assembly for dump trucks and the like having upstanding side and end walls defining an upwardly open body for receiving particulate material which may project upwardly beyond the sides of body; said cover assembly comprising a flexible top cover substantially co-existensive with the body cross section viewed from above, said cover extending across the top of a front end portion of said body and being attached thereto whereby completely to close said end portion of the body and to prevent air flow beneath the cover and billowing and particulate leakage, a take-up roll for said flexible cover having an opposite end portion of the cover attached thereto substantially across its width and having associated biasing means tending to rotate the roll in a take-up operation of the cover, a pair of similar arms pivotally mounted at lower end portions externally on opposite side walls of the truck body and having upper end portions connected with and rotatably supporting opposite end portions of said take-up roll, and operating means for swinging said arms rearwardly for an arcuate roll traverse of the truck body, the said rearward movement being a cover roll-out movement and being opposite to the direction which said biasing means tends to swing said arms while urging said cover in a take-up direction about said roll, said cover during both roll-out and take-up thus having substantially no horizontal component of movement with respect to said particulate material.

4,050,735

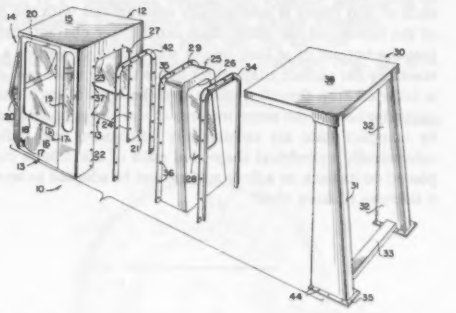
MULTI-PURPOSE CAB FOR CONSTRUCTION VEHICLES

John Molnar, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 22, 1975, Ser. No. 615,441

Int. Cl.[2] B62D *25/06*

U.S. Cl. 296—102 **18 Claims**



1. A multi-purpose operator's cab adapted for use on a construction vehicle comprising;

a basic cab unit including a pair of laterally spaced side panels,

a front panel secured between forward ends of said side panels,

a top panel secured on said side and front panels,

a rear panel secured between rearward ends of said side and top panels, and

first mounting flange means formed on said rear panel, and

at least one rear member mounted on said rear panel and at least generally co-extensive therewith,

second mounting flange means formed on the periphery of said rear member, and

fastening means releasably securing said first and second mounting flange means together.

4,050,736

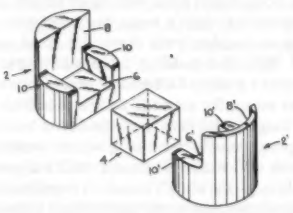
COMPACTABLE FURNITURE

Natan Karp, 9 Tel-Hai Str., Jerusalem, Israel

Filed Apr. 7, 1976, Ser. No. 674,401

Int. Cl.[2] A47B *39/00*

U.S. Cl. 297—135 **5 Claims**



1. A compactable furnishing unit comprising two chairs and a shaped body wherein each chair is characterized by a seating surface, an upwardly extending backrest and two upwardly extending arm rests, said unit being characterized in that said shaped body is adapted to fit into the area defined by the seating surface, backrest and armrests of one of said chairs and to extend upwardly beyond the top of said armrests and that the second chair of said unit is adapted to be inverted and to rest with its armrests on the armrests of said first chair and with a portion of said shaped body extending into the area defined

by the seating surface, backrest and armrests of said second chair whereby the armrests of said second inverted chair are aligned with and maintained in position atop the armrests of said first chair by said shaped body and said unit of two chairs and a shaped body thereby form a compact unit, the combined height of the armrests of said first chair and the armrests of said second chair being substantially equal to the height of each of the backrests of said chairs whereby when said second chair is inverted onto said first chair the top surface of the backrest of each of said chairs is substantially continguous with the plane of the bottom of the other chair and further characterized in that the bottom of at least one of said chairs comprises a substantially flat surface adapted for use as a table when said chair is inverted atop the other chair, and the back of each chair is curved whereby the outer surfaces of the chairs of said unit in its compact state are substantially contiguous and define a substantially cylindrical shape and each of said chairs can be placed on its back on a floor surface and be adapted to serve as a sideway rocking chair.

4,050,737

SUPPORT HARNESS

Ruth Frances Jordan, 3095 Monticello Blvd., Cleveland Hts., Ohio 44118

Filed Aug. 30, 1976, Ser. No. 718,832
Int. Cl.[2] A47D *13/08*
U.S. Cl. 297—389 **8 Claims**

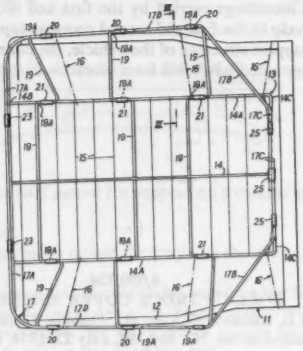
1. A support harness for firmly and comfortably supporting a child with cerebral palsy and the like against the back of a chair in normal sitting position comprising a back portion having means at shoulder and hip levels for detachably securing said back portion to the back of a chair; padded lateral flaps at opposite sides of said back portion of length and width for wrapping around a child's torso over the sides thereof and overlapping each other over the entire chest and abdomen, said lateral flaps and padding therein having cutouts to fit under the child's armpits for freedom of arm movement; releasable fastener means for securing said flaps in such overlapping relation; a longitudinal flap from the lower end of said back portion of progressively narrowing width to extend forwardly from the back of the chair under the child's hips and to extend upwardly through the child's crotch to overlie said overlapped lateral flaps substantially to the upper edges thereof; and shoulder straps including releasable fastener means to interconnect the upper end of said back portion to the end portion of said longitudinal flap, said lateral flaps and said longitudinal flap when wrapped around a child's trunk as aforesaid forming leg openings at the upper portions of the thighs for freedom of leg movement while the child is retained in normal erect sitting position; the padding in said lateral flaps beginning inwardly of said cutouts in the region of the back portion where the child's back curves away from the back of the chair thus to stiffen, without sacrifice of comfort, the portions of the harness which embrace the sides of the child's trunk.

4,050,738

SEAT FRAMES

David Thomas Griffiths, Pontardulais, Wales, assignor to Youngflex, S.A., Fribourg, Switzerland

Continuation-in-part of Ser. No. 440,782, Feb. 8, 1974, abandoned. This application Aug. 13, 1975, Ser. No. 604,177
Claims priority, application United Kingdom, Feb. 16, 1973, 7874/73
Int. Cl.[2] A47C *7/02*
U.S. Cl. 297—452 **3 Claims**



1. A seat frame comprising:

a base frame,

b. a cushion support including longitudinally extending side wire portions and a plurality of spaced, transversely extending cross wires anchored between said side wire portions,

c. a plurality of tension spring means anchored between said side wire portions and said base frame to suspend said cushion support in tension transversely with respect to said base frame,

d. a plurality of spaced spring elements each comprising a central portion extending transversely between said side wire portions, intermediate torsional portions extending parallel with and adjacent said side wire portions, and end portions extending transversely and outwardly from said torsional portions, in an upward direction from and at an obtuse angle to said cushion support,

e. means loosely connecting each of said torsional spring element portions to the adjacent side wire portion of said cushion support along a substantial portion of the length of the former,

f. an edge frame arranged above said cushion support and including resilient edge wire portions extending adjacent the free ends of the end portions of said spring elements at the respective sides of the seat, and

g. means connecting the free ends of the end portions of said spring elements to said edge frame.

4,050,739

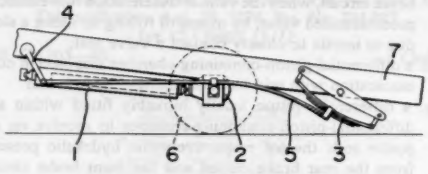
UNLOADING APPARATUS OF TRUCK

Terumasa Toyooka, 1-734, Sakae, Ikeda, Osaka, Japan

Continuation of Ser. No. 419,207, Nov. 26, 1973, abandoned. This application Aug. 25, 1975, Ser. No. 607,387
Int. Cl.[2] B60P *1/04*
U.S. Cl. 298—19 V **4 Claims**

2. In a vehicle, a chassis, a drive shaft, a driving axle journaling ground-engaging wheels at its respective ends, a first resiliently flexible beam secured at its forward end to said chassis and extending rearwardly to and adjacent said axle, a first sliding connection between the axle and said first beam, to enable said axle to translate in the fore-and aft direction with respect to said chassis, spring support means attached to the rearward end of said first beam and to said chassis, for support-

ing the latter, said axle being translatable on and along said first beam, said drive shaft comprising forward and rearward aligned sections telescopically connected for conjoint rotation



about common fore-and aft axis, and means carried by said axle and connected with the rearward end of the rearward section to rotate the ground-engaging wheels by and in response to rotation of said shaft.

4,050,740

METHOD OF AND APPARATUS FOR MELTING BLOCK SULPHUR

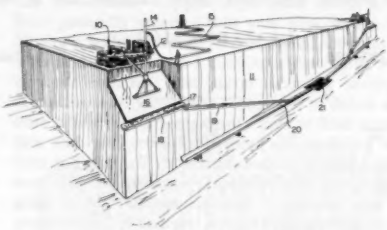
Ernest Ralph Ellithorpe, 267-43rd Ave., North West, Calgary, Alberta, Canada (T2K 0H9), and Richard Calvin Ellithorpe, 336 Cedarbrae Crescent, South West, Calgary, Alberta, Canada (T2W 1Y4)

Filed Feb. 18, 1976, Ser. No. 659,159

Claims priority, application United Kingdom, Feb. 20, 1975, 7098/75; May 2, 1975, 18343/75

Int. Cl.[2] E21C *37/16, 41/14;* **B01J** *1/00, 6/00*

U.S. Cl. 299—6 **15 Claims**



1. A method of melting block sulfur, comprising the steps of:

positioning a heating element on a block of sulfur so the heating element is downwardly inclined towards and projects beyond an edge of the sulfur block;

supplying steam to said heating element to melt the sulfur beneath said heating element, whereby said melted sulfur flows downwardly at the underside of said heating element, to which it adheres by surface tension, and beyond said edge of the sulfur block; and

collecting said melted sulfur beyond said edge.

5. Apparatus for melting block sulphur, comprising:

a heating element;

said heating element defining a plurality of mutually spaced flow passages in a generally planar array;

steam inlet passage means communicating with said flow passages for supplying steam thereto;

outlet means communicating with said flow passages for discharging condensate therefrom;

means defining a flow surface at the underside of said heating element at and adjacent at least one edge thereof for flowing molten sulphur by surface tension along the underside of said flow surface;

overhead suspension means extending downwardly to said heating element for suspending said heating element at an inclination, with said heating element being downwardly inclined towards said edge thereof;

said suspension means including means for raising and lowering said heating element; and

trough means extending along and beneath said flow surface for collecting the melted sulphur beneath said flow surface defining means.

4,050,741

FEEDING CUT TOBACCO

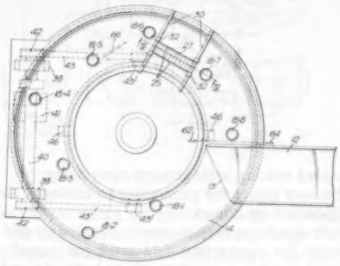
William H. C. Dickinson, Winchester, England, assignor to W. H. Dickinson Engineering Limited, United Kingdom

Filed Nov. 28, 1975, Ser. No. 635,754

Claims priority, application United Kingdom, Nov. 28, 1974, 51679/74

Int. Cl.[2] B65G *53/24, 53/40*

U.S. Cl. 302—13 **16 Claims**



9. Apparatus for distributing tobacco, comprising an annular tray, means for delivering tobacco onto the annular tray as a carpet spread across a radius of the tray, means for driving the tray to convey the tobacco along a circular path around the tray, a number of fixed feed pipes extending downwards towards the tray and having tobacco inlet ends positioned near the tray at various distances from the axis of the tray, tobacco being sucked up from the tray through the feed pipe, and separator means for substantially separating the part of the tobacco carpet which passes beneath each inlet end from adjacent parts of the carpet for application to the respective feed pipe.

4,050,742

TRANSPORTING HEAVY FUEL OIL AS A SLURRY

Raymond H. Hughes, La Place, La., and Carl D. Clay, Casper, Wyo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Nov. 4, 1976, Ser. No. 738,799

Int. Cl.[2] B65G *53/30*

U.S. Cl. 302—66 **6 Claims**

1. A process for transporting heavy fuel oil as a slurry in water, the process comprising:

a. separating the heavy fuel oil into a first portion and a second portion;

b. fractionating the first portion into a relatively low pour point fraction and a relatively high pour point fraction;

c. recombining the relatively low pour point fraction with the second portion;

d. substantially congealing at least a portion of the second portion of the heavy fuel to obtain congealed particles of the heavy fuel oil;

e. coating the congealed particles with the relatively high pour point fraction;

f. slurrying the coated, congealed particles in a carrier liquid; and

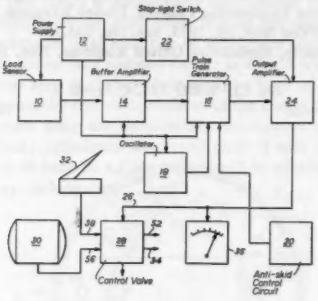
g. transporting the slurry in a transportation system.

4,050,743

LOAD DEPENDENT CONTROL ARRANGEMENTS

David John Knight, Bath, England, assignor to Bendix Westinghouse Limited, Bristol, England

Filed May 24, 1976, Ser. No. 689,213
Claims priority, application United Kingdom, June 3, 1975, 23941/75
Int. Cl.[2] B60T 8/18
U.S. Cl. 303—22 R 32 Claims



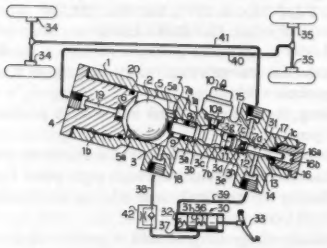
1. A load sensing arrangement comprising:
load sensor means for generating an analogue electric signal dependent on a load;
electric signal conversion means coupled to said load sensor means for converting said analogue signal to a binary signal having a mark-to-space ratio dependent on the magnitude of said analogue signal;
electrically operated fluid valve means coupled to said conversion means to alternately open and close a fluid valve in accordance with the marks and spaces in said binary signal;
a source of predetermined fluid pressure coupled to said fluid valve means to have said predetermined fluid pressure alternately passed and blocked by the opening and closing of said valve to produce an output of said fluid valve means which is dependent both on said predetermined pressure and on said load.

4,050,744

SAFETY DEVICE FOR USE IN A VEHICLE BRAKE

Tomoyuki Nogami, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Jan. 5, 1977, Ser. No. 756,976
Claims priority, application Japan, Sept. 18, 1976, 51-112098
Int. Cl.[2] B60T 8/14, 17/18
U.S. Cl. 303—24 A 10 Claims



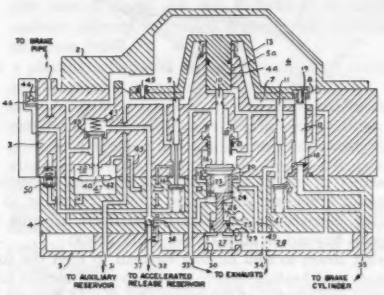
1. A safety device for use in a vehicle hydraulic brake comprising:
a. a valve casing installed in a hydraulic circuit interconnecting the tandem type master cylinder for the vehicle hydraulic brake and the front/rear wheel cylinders;
b. a ball-containing-chamber formed within said valve casing to serve as a part of the hydraulic circuit communicating to said rear wheel cylinders;
c. a ball accommodated in said ball-containing-chamber adapted to shut off the path of braking-fluid to the rear brake circuit, when the vehicle deceleration rate exceeds a predetermined value, by means of rolling up along a slope due to inertia to closely contact a valve seat;
d. a differential-piston-containing-chamber disposed in communication with said ball-containing-chamber; and
e. a differential piston axially movably fitted within said differential-piston-containing-chamber to receive on opposite ends thereof respectively the hydraulic pressure from the rear brake circuit and the front brake circuit, wherein when the rear brake circuit is damaged or broken down, said piston slides toward said ball to urge the same against said valve seat due to the difference of pressure in both circuits, and when the front brake circuit is broken down, said piston slides in the reverse direction similarly due to the difference of pressure to shut off the path of the braking-fluid to the front brake circuit.

4,050,745

BRAKE CONTROL VALVE APPARATUS

David John Wickham, London, England, assignor to Westinghouse Brake & Signal Company, Ltd., England

Filed Dec. 8, 1975, Ser. No. 638,463
Claims priority, application United Kingdom, Jan. 3, 1975, 208/75
Int. Cl.[2] B60T 15/52
U.S. Cl. 303—36 2 Claims



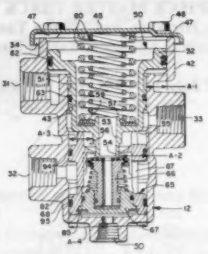
1. A fluid operable brake control valve apparatus having a brake cylinder valve means for controlling the supply of fluid pressure into and out of a brake cylinder, said valve means being operable by a main pressure responsive member movable in response to changes of pressure when applied to a brake pipe, a quick service valve operable in response to such a change tending to cause a brake application for connecting a quick service volume to the brake pipe to enhance the change at commencement of an application, accelerated release valve means operable in response to release of fluid pressure from the quick service volume to connect a charged accelerated release reservoir to the brake pipe to assist a change of pressure in the brake pipe causing such release, a further pressure responsive member for operating said accelerated release valve, one side of said member being subject to quick service volume pressure and communicating with the other side thereof through a choke, and means for normally biassing said further pressure responsive member towards a position in which the accelerated release valve is closed.

4,050,746

INVERSION BRAKE VALVE AND SYSTEM THEREFOR

Harold Durling, Elsie, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Division of Ser. No. 611,648, Sept. 9, 1975, Pat. No. 4,017,125. This application Aug. 19, 1976, Ser. No. 716,027
Int. Cl.[2] B60T 15/12
U.S. Cl. 303—40 3 Claims



1. A valve for use with brake actuators in a fluid-actuated braking system where sources of pressure at varying levels exist at valve ports comprising:

a valve body having a generally closed cylindrical bore therein, said body having a first inlet port in fluid communication with one end of said bore, a vent port in fluid communication with the opposite end of said bore, second and third inlet ports and a delivery port in fluid communication with said bore;

a first cylindrically stepped single-piece piston within said bore generally adjacent said vent port, said first piston having a hollow stem in fluid communication at one end with said vent port and defining a first valve seat at its opposite end, said first piston including sealing means circumferentially disposed thereabout to define with said bore a first pressure responsive area in fluid communication with said second inlet port and to define with said bore and said first valve seat a second pressure responsive area said first pressure responsive area being at least as great as said second pressure responsive area but not greater than 1.5 time said second pressure responsive area;

biasing means contacting said first piston tending to move said first piston toward said first inlet port;

a second cylindrically stepped piston within said bore generally adjacent said first inlet port, said second piston including a second valve seat facing and generally concentric with said first valve seat, second sealing means circumferentially disposed about said second piston to define with said bore a third pressure responsive area in fluid communication with said first inlet port and to define with said bore and said second valve seat a fourth pressure responsive area in fluid communication with said third inlet port;

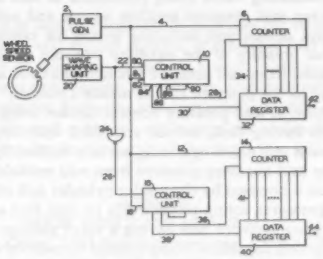
sealing means associated with one of said pistons effective to (i) seal said first and second valve seats to prevent fluid communication between said third inlet port, said vent port and said delivery port when said pressure at said outlet port acting over said second pressure responsive area equals the pressure exerted by said biasing means and said pressure developed at said first inlet port is typically zero to define a lapped position of said valve and (ii) sealing said first valve seat while opening said second valve seat to provide fluid communication between said delivery port and said vent port at a rate equal to the ratio of said first area and divided by said second area as pressure is supplied to said second inlet port to define a dump position of said valve; said valve moving from said dump position to said lapped position when the pressure at said delivery port acting over the second area is equal to the pressure at said first port times the ratio of the second area divided by the first area.

4,050,747

DIGITAL WHEEL SPEED CIRCUIT ARRANGED TO COMPENSATE FOR DIMENSIONAL IRREGULARITIES OF SENSOR ROTOR MEMBER

Gerhard Ruhnau; Wolfgang Gudat, both of Hannover; Peter Liermann, and Karl-Heinz Hesse, both of Gehrden, all of Germany, assignors to WABCO Westinghouse GmbH, Hannover, Germany

Filed Jan. 10, 1977, Ser. No. 757,830
Claims priority, application Germany, Apr. 17, 1976, 2616972
Int. Cl.[2] B60T 8/02
U.S. Cl. 303—95 7 Claims



1. A circuit for providing a digital speed signal according to the angular velocity of a vehicle wheel comprising:

a. a wheel speed sensor device including a toothed rotor rotatable with the wheel, said sensor device generating a sinusoidal voltage having a fundamental frequency proportional to the rotational speed of the toothed rotor;

b. means for converting said sinusoidal voltage into a square wave signal; and

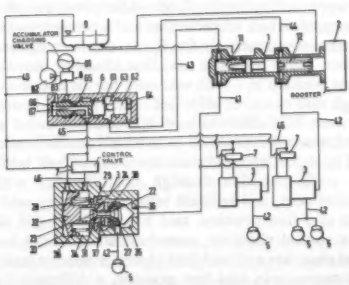
c. means for measuring the time duration between two positive polarity transitions of said square wave signal occurring at full cycle intervals and between two negative polarity transitions of said square wave signal occurring at full cycle intervals to provide said digital speed signal for each said full cycle interval thereof, said full cycle intervals defined by said positive and said negative polarity transitions having an overlapping relationship therebetween.

4,050,748

BRAKING SYSTEM HAVING ANTI-SKID CONTROL

Juan Belart, Walldorf, Germany, assignor to ITT Industries, Incorporated, New York, N.Y.

Filed May 3, 1976, Ser. No. 682,867
Claims priority, application Germany, Aug. 23, 1976, 2519835
Int. Cl.[2] B60T 8/02
U.S. Cl. 303—114 10 Claims



1. A braking system having anti-skid control wherein a pressure control device is interposed in at least one line form-

ing a connection between a master cylinder and at least one wheel cylinder, said pressure control device including a housing carrying a piston having operating surfaces which are acted on by the wheel cylinder pressure and by an auxiliary pressure from a pressure medium source through a modulating valve, said modulating valve being able to block a connection between the pressure medium source and the pressure control device and to open a return connection, said pressure control device also including a valve member therein operable by said piston which is capable of blocking said connection between said master cylinder and said wheel cylinder, including:

a connecting line forming a connection between said pressure medium source and said modulating valve,

said modulating valve being positioned in said connection between said pressure medium source and said pressure control device and including means for controlling the output pressure of the auxiliary pressure which may be obtained from said pressure medium source so as to correspond to the pressure in said master cylinder;

said piston in said pressure control device being a stepped piston having first, second and third operating surfaces wherein said third operating surface is directly operated on by said auxiliary pressure from said modulating valve which is opposed by the master cylinder and wheel cylinder pressures acting respectively on said first and second operating surfaces, and having a valve passage formed in said piston capable of being opened by said valve member positioned in said piston after said connection to said master cylinder has been blocked, said valve passage forming a connecting passage leading from a chamber in said housing in front of said second operating surface.

4,050,749

CONTROL VALVE ASSEMBLIES FOR VEHICLE ANTI-SKID BRAKING SYSTEMS

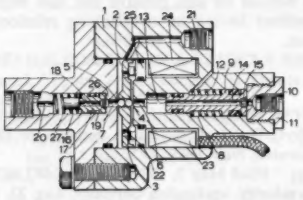
David Anthony Harries, and Ivan Mortimer, both of Solihull, England, assignors to Girling Limited, Birmingham, England

Filed Jan. 17, 1977, Ser. No. 759,897

Claims priority, application United Kingdom, Mar. 10, 1976, 09467/76

Int. Cl.[2] B60T *8/08*

U.S. Cl. 303—119 **7 Claims**



1. A control valve assembly for a vehicle hydraulic braking system comprising a housing having an inlet port for connection to a supply of hydraulic fluid under pressure, an outlet port for connection to a wheel brake, and a pressure-relief port for connection to a reservoir for fluid, said housing having a first chamber, valve means in said first chamber movable between a first position in which said inlet port is in communication through said chamber with said outlet port and communication between said chamber and said pressure-relief port is closed, and a second position in which communication between said inlet port and said chamber is cut-off and said outlet port is in communication through said chamber with said pressure-relief port, and resilient means for urging said valve means into said first position, said housing having a stepped bore and a second chamber, communicating means between said second chamber and said first chamber open at least when said valve means is in said first position, a differential piston working in said stepped bore in said housing and having opposite ends of greater area and of smaller area, said end of greater area being exposed to said inlet port and said end of smaller area being exposed to said second chamber, said piston having a restricted passage through which said inlet port communicates at all times with said second chamber, said second chamber being located in said housing between said smaller diameter end of said piston and an adjacent inner end of said stepped bore.

4,050,750

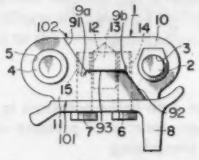
TWO-PIECE MASTER TRACK LINK

Akira Yoshihashi, Hirakata, and Hiraku Yamada, Kyoto, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed July 11, 1975, Ser. No. 595,032

Int. Cl.[2] B62D *55/28*

U.S. Cl. 305—54 **10 Claims**



1. In a master track link for connecting an endless track which has an outer surface for receiving a track shoe and an opposite inner surface, while at one side thereof is formed a pin connection bore for receiving and retaining a track pin and at the other side thereof is formed a pin bushing connection bore for receiving the bushing of another track pin, said master track link being separable into two vertically overlapping and substantailly half link parts which are tightly coupled and interlocked with each other along an approximatley diagonal juncture defined by respective mating surfaces of said link parts by means of shoe bolts of which at least one of them extends from an outer surface of said track shoe to one link part while penetrating through the other link part adjacent to the track shoe so that both the link parts and the track shoe are fixedly secured simultaneously with each other, the improvement characterized in that each of said respective mating surfaces of said link parts comprises a first diagonal flat surface part located between one side end portion of said inner surface of said master track link and a vertically intermediate portion thereof, a second diagonal flat surface part located between a diagonally opposite side end portion of said outer surface of said master track link and a vertically intermediate portion thereof, an intermediate flat surface part extending between the first and the second diagonal surface parts in parallel to both said outer and inner surfaces of said master track link and at least one cavity which registers with another corresponding complementary cavity formed in the intermediate surface part of the associated link part so as to form a hollow space the longitudinal axis of which extends in a direction perpendicular to the outer and inner surfaces of said master track link between the link parts in which a traction and thrust bearing means corresponding to said hollow space is tightly fitted when said link parts are coupled and interlocked with each other together with said track shoe.

4,050,751

DOCUMENT CAROUSEL

Klaus K. Stange, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 11, 1976, Ser. No. 665,826

Int. Cl.[2] A47F *1/00*; B65H *5/22*

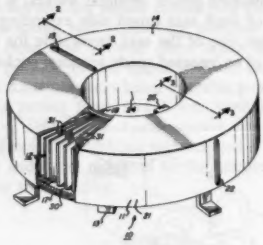
U.S. Cl. 312—197 **10 Claims**

1. Apparatus for storing documents, comprising:

a. a carousel having a number of pockets;

b. a structure for covering the pockets, said structure having an opening;

c. drive means for rotating the carousel with respect to the



structure, whereby said pockets may be aligned with the opening; and

d. fluidic means for moving documents stored in said pockets through said opening.

4,050,752

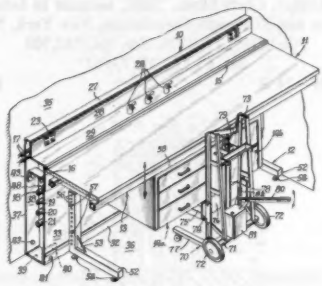
MODULAR LABORATORY CABINETS ADJUSTABLE IN ELEVATION

Donald P. Dykstra, Des Plaines, Ill., assignor to Portable Laboratories, Inc., Elk Grove Village, Ill.

Filed Apr. 12, 1976, Ser. No. 676,151

Int. Cl.[2] A47B *9/00*; F16L *3/22*

U.S. Cl. 312—243 6 Claims



1. For use in a room having a floor, the combination of a utility cabinet for holding utility conduits, a table top and means for supporting the table top in front of said utility cabinet, wherein

said means having an adjustment for permitting the table top to be set at a plurality of elevations within a selected range;

said utility cabinet having a front comprising an upper portion and a lower portion, said upper portion being solid throughout said range of elevations, said lower portion having an access opening to provide access to said utility conduits, and door means for said access opening.

4,050,753

BRACEABLE RAIL

Kurt Scherrer, Munsingen, Switzerland, assignor to U. Scharer Sohne AG, (USM), Munsingen, Switzerland

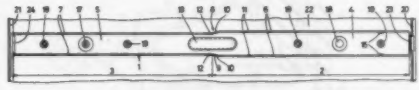
Filed Sept. 1, 1976, Ser. No. 719,374

Claims priority, application Switzerland, Sept. 5, 1975, 11535/75

Int. Cl.[2] E04C *3/30*

U.S. Cl. 312—257 SK 2 Claims

1. A rail intended to be braced between and form-lockingly connected at each end thereof to two support members, comprising two substantially U-shaped sectional bars each having two leg portions and being formed of first and second contiguous segments with a region of transition therebetween, said first segments being wider in cross-section than said second segments, said bars being mutually nested with the respective leg portions thereof directed toward each other, whereby said



leg portions in said first segment of each said bar embrace said leg portions in said second segment of the other said bar, each said region of transition including a latch surface, and said latch surfaces cooperating to exert an axially-directed force upon said bars for displacing said bars axially in opposite directions, wherein each said latch surface is plane and inclined with respect to the longitudinal axis of the respective said bar.

4,050,754

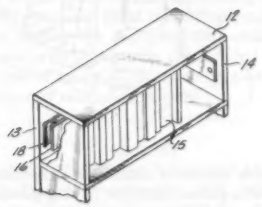
BOOK EJECTION APPARATUS

Charles L. Coley, 1303 Summertime Lane, Culver City, Calif. 90230

Filed Sept. 12, 1975, Ser. No. 612,944

Int. Cl.[2] A47B *23/00*

U.S. Cl. 312—319 9 Claims



8. A book ejection system for use in a book case having at least one horizontal shelf, two vertical sides and at least one vertical back plate comprising a rectangular shaped back panel mounted on said vertical back plate substantially parallel thereto, compression resistant means having reactive characteristics mounted on said rectangular shaped back panel and a rectangular shaped front panel mounted on said compression resistant means substantially parallel to said back panel and maintained in a spaced relationship with respect to said back panel by at least one flexible bingee whereby when books positioned on said horizontal shelf susstantially against said front panel are pushed toward said vertical back panel and released, said book will be moved in a direction away from said back panel to a position spaced from said front panel by the reactive force of said compression resistance means.

4,050,755

ELECTRICAL CONNECTOR

Alexander William Hasircoglu, Lancaster, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

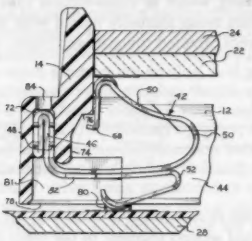
Filed Apr. 2, 1976, Ser. No. 672,885

Int. Cl.[2] H05K *1/12*

U.S. Cl. 339—17 CF 8 Claims

6. As an article of manufacture, an electrical contact formed from a strip of conductive spring metal, said contact having a fold intermediate its ends and extending from the fold as opposed unbalanced compound cantilever springs, said springs having straight first legs extending in the same direction from said fold, the included angle between said first legs being about

10°, each spring having a second leg joined to its first leg by an arcuate bend, the included angles said first legs located between said second legs, having an arcuate contact segment adjacent its ends.

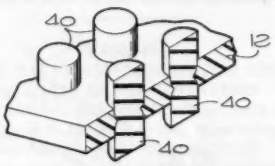


4,050,756

CONDUCTIVE ELASTOMER CONNECTOR AND METHOD OF MAKING SAME

John R. Moore, Santa Ana, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 22, 1975, Ser. No. 642,686
Int. Cl.[2] H01R *13/24;* H05K *1/04*
U.S. Cl. 339—59 M **2 Claims**



1. A conductive elastomer connector comprising:
a nonconductive planar subsirate having generally parallel upper and lower surfaces;
a plurality of etched holes extending through said substrate from said upper surface to said lower surface;
a conductive elastomer rod retained in each of said holes, said rods extending above said upper surface and below said lower surface;
each said etched hole having an underetch pattern providing an inwardly extending annular ridge spaced from said upper and lower sufaces; and
each said rod having an annular recess in its outer surface spaced from said upper and lower surfaces and receiving said annular ridge therein whereby said rods are retained in said holes by said ridges.

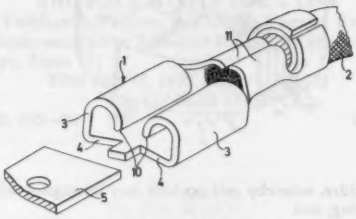
4,050,757

INSULATING CASING FOR ELECTRICAL SPADE TERMINAL SOCKETS

Gottfried Glaesel, Minusio, Switzerland, assignor to Hego Electric GmbH, Glarus, Switzerland

Filed Feb. 25, 1976, Ser. No. 661,222
Int. Cl.[2] H01R *13/50*
U.S. Cl. 339—59 R **2 Claims**

1. An insulating casing for an electrical spade terminal socket of the kind having a web and inwardly bent lateral gripping portions laterally spaced from one another, said casing consisting of an integral body of insulating material adapted to be slid over a said socket from the front end of the latter, the casing being of substantially rectangular cross-section having two opposite narrow sides and two opposite broad sides, front end stop means for the socket at the front end of the casing formed solely by two protuberances which project symmetrically into the internal space of the casing from the narrow sides thereof, rear stop means spaced from said front end end formed by two symmetrically disposed ratchet teeth projecting into the internal space of the casing from respective broad sides thereof for engaging the rear ends of said gripping portions of an inserted spade terminal socket, a rib on the internal surface of each said broad side extending along the longitudinal center line of the said broad side for supporting the web portion of an inserted spade terminal socket, said ribs



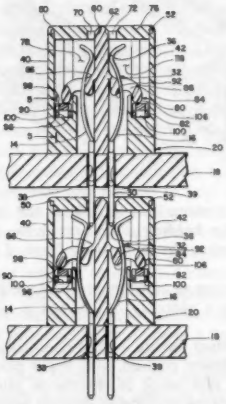
and said teeth projecting from each said broad side into the internal space of the casing for substantially equal distances, and symmetrically disposed noses on both broad sides in the casing at the front end thereof for guiding a spade terminal into the socket, whereby the casing can be slid over a spade terminal socket from the front of the latter in either one of two orientations which are offset by 180° with respect to each other.

4,050,758

ZERO INSERTION FORCE CONNECTOR

James H. Curley, Costa Mesa, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 17, 1976, Ser. No. 742,700
Int. Cl.[2] H01R *13/62*
U.S. Cl. 339—74 R **10 Claims**



1. A zero insertion force electrical connector comprising:
an elongated insulative housing having a row of contacts therein, said housing being open to the top for receiving therein conductors on an electrical component;
said housing including walls on opposite sides of said row of contacts;
said contacts having spring contacting portions extending resiliently toward a vertical plane passing through one of said walls for engaging said conductors inserted into said housing;
means for retracting said contacting portions away from said vertical plane;
said retracting means comprising contact shifting means and

cam actuator means, said contact shifting means having a hinged connection to said one wall and a free end adjacent to the other of said walls for vertical pivotal movement between a lower position and an upper position;

said contact shifting means embodying cam surface means for retracting said contacting portions of said contacts away from said vertical plane when moved from said lower position to said upper position; and

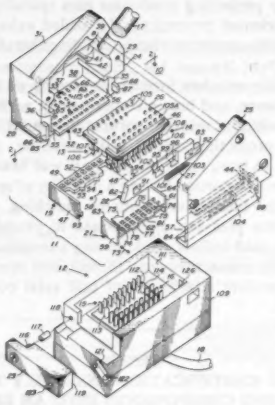
said cam actuator means being operable to move said contact shifting means from said lower position to said upper position, said cam actuator means comprising an elongated element underlying said free end of said cam shifting means and being mounted for longitudinal sliding movement in said housing.

4,050,759

ZERO-INSERTION-WITHDRAWAL FORCE CONNECTOR

Robert Andrew Jackson, III, Evanston, and Harry G. Willis, Plainfield, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 21, 1976, Ser. No. 689,431
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—75 M **7 Claims**



1. A zero-insertion-withdrawal force connector assembly comprising:

a first connector block having first and second contact fingers projecting therefrom, the planes of said first contact fingers being disposed at right angles to the planes of said second contact fingers,

a second connector block having third and fourth contact fingers projecting therefrom, the planes of said third contact fingers being disposed at right angles to the planes of said fourth contact fingers,

said second connector block being adapted to be disposed adjacent said first connector block with said third contact fingers lying alongside said first contact fingers but out of contact therewith and with said fourth contact fingers lying alongside said second contact fingers but out of contact therewith,

first means for moving said first and third contact fingers into engagement with each other in one direction,

second means for moving said second and fourth contact fingers into engagement with each other at right angles to the movement of said first means,

relative movement interengaging means between said first means and said second means for effecting movement of said first means at right angles to the movement of said second means and in response thereto when said second means is moved, and

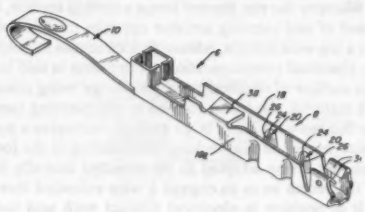
third means for moving said second means.

4,050,760

SOLDERLESS ELECTRICAL CONTACT

Lawrence S. Cohen, Chicago, Ill., assignor to TRW Inc., Elk Grove Village, Ill.

Filed Feb. 10, 1976, Ser. No. 656,934
Int. Cl.[2] H01R *9/08*
U.S. Cl. 339—97 R **9 Claims**



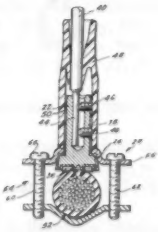
1. An insulation rupturing wire termination contact element for establishing and maintaining electrical contact with the conductive core of an insulated wire as the insulated wire is forced into the contact element, comprising a wire termination channel portion having side panels and a base portion of thin conductive sheet metal, at least one of said side panels having an integral offset portion formed inwardly into said channel to engage the conductive core of a wire inserted therein, said offset portion having an end exposed toward the open side of said channel which end is formed by bending said sheet metal into a smoothly rounded blunt transitional configuration having sufficient rigidity for rupturing the insulation of a wire forced into said wire termination channel and for guiding the conductive core of such a wire into contact with the inwardly disposed surface of said offset portion.

4,050,761

CUP-SHAPED UNDERGROUND TAP CONNECTOR

Robert V. De France, Poughkeepsie, N.Y., assignor to Fargo Mfg. Company, Inc., Poughkeepsie, N.Y.

Filed July 16, 1976, Ser. No. 705,806
Int. Cl.[2] H01R *11/20*
U.S. Cl. 339—97 R **3 Claims**



1. A connector for joining a tap conductor to a run conductor of an underground cable system without removing the insulation from the run conductor comprising: respective insulated and uninsulated portions of said tap conductor, a body of conductive material adapted to be connected to said uninsulated portion, a piercing member of said body for passage through the insulation of said run conductor, clamping means for coupling said piercing member to said run conductor, adjustment means of said clamping means for bringing said piercing member into tight interengagement with said run conductor and supplying sufficient force to direct said piercing member through the insulation of said run conductor and into electrical communication with the interior thereof, said piercing member having a cup-shaped configuration to permit

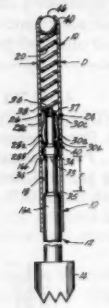
piercing of the insulation and collection of a plug of insulation therein so as to minimize the stresses on the remainder of the insulated run conductor when the piercing member is electrically connected with the interior of the run conductor to complete an electrical connection between said run conductor and said tap conductor connected to said piercing member, said body being substantially tubular in configuration terminating in a lower flanged end, said piercing member extending from said flanged end and being of hollow cylindrical configuration whereby the rim thereof forms a cutting surface, a recess in the end of said piercing member opposite the flanged end to receive a tap wire therein, releasable lock means to hold the tap wire in electrical communication in the recess in said body, the exterior surface of said body and said flange being coated with a nylon material, the recess formed in said piercing member to receive the tap wire being large enough to receive a multiplicity of size wires and said locking means being in the form of at least one set screw adapted to be threaded laterally into and out of the recess so as to engage a wire extended therein and retain it in position in electrical contact with said body, and said body and said piercing member being of aluminum material.

4,050,762

TELESCOPING SPRING PROBE HAVING SEPARATE WIPER CONTACT MEMBER

Clyde Kenneth Hines, Arcadia; Everett James Long, Claremont, and Lawrence Eugene Wysocki, Covina, all of Calif., assignors to Everett/Charles, Inc., Pomona, Calif.

Filed Nov. 10, 1976, Ser. No. 740,396
Int. Cl.[2] H01R *13/00*
U.S. Cl. 339—108 TP **21 Claims**



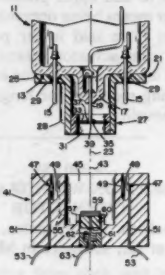
1. A miniature low resistance telescoping spring probe comprising:
telescoping tubular housing and inner plunger both being elongated and of an electrically conductive material;
said plunger comprising a probe head, external to said housing;
engaged and concentric inner wall on said housing and outer wall of said plunger providing a sliding electrical connection and a bearing therebetween;
a coil compression spring urging said housing and plunger in longitudinally opposite directions;
a separate low electrical resistance wiper spring member affixed to said plunger;
a substantially constant low electrical resistance connection between said wiper spring member and plunger;
said wiper spring member comprising at least one longitudinally extending leg spring loaded outwardly into engagement with said inside wall; and
a bearing surface on said leg in engagement with said inside wall and thereby providing a substantially constant low electrical resistance connection between said wiper spring member and inside wall during telescoping movement.

4,050,763

BASE AND SOCKET MEANS FOR AN ELECTRON TUBE

Harry E. Smithgall, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Aug. 16, 1976, Ser. No. 715,176
Int. Cl.[2] H01R *13/66*
U.S. Cl. 339—111 **11 Claims**



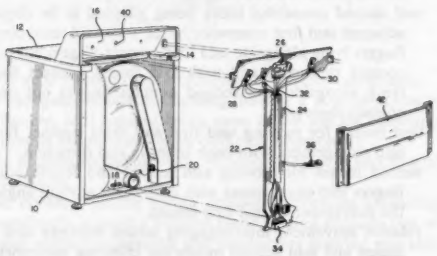
1. A protective and connective base for a multi-element electron tube having a closure portion incorporating an array of exteriorly projecting conductor pins spatially surrounding an axially oriented protrusion of a sealed exhaust tubulation having an axial conductive lead extending therefrom, said base comprising:
an insulative member formed for seating on the surface of said closure, said base member having a longitudinal axis about which a rim-like portion surrounds an axially-oriented projecting substantially hollow stack portion formed to protectively encompass said sealed tubulation, said rim-like portion having a plurality of spatially related apertures therein substantially matching said array of conductor pins and dimensioned to promote adherence thereto, said hollow stack having a terminal opening and a metallic contact recessed therein, said contact formed to accommodate attachment of said axial conductive lead thereto.

4,050,764

INTRINSIC CERTIFICATION ASSEMBLY TECHNIQUE FOR WIRING COMPONENTS INTO AN ELECTRICAL APPARATUS

John Root Hopkins, Belleair, Fla.; Robert Maurice Renn, and Robert Keith Southard, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 649,009, Jan. 14, 1976, Pat. No. 4,006,959, which is a division of Ser. No. 520,399, Nov. 4, 1974, Pat. No. 3,970,354. This application Aug. 17, 1976, Ser. No. 715,095
Int. Cl.[2] H01R *3/00*
U.S. Cl. 339—103 M **1 Claim**



1. An improved electrical connector housing comprising:
an elongated, continuous base member having a plurality of parallel, substantially identical contact receiving passages

transversely spaced therealong, each said passage including an open rear end portion defined by a pair of parallel spaced walls integrally upstanding from said base member, each said wall having a longitudinal ledge on both sides thereof, and a closed, substantially cylindrical front end portion and means in each passage engageable with latching means of a respective contact received therein,

a strain relief cover having a plurality of spaced pairs of integral leg portions depending from an elongated continuous member, each said leg portion having a longitudinally extending step engageable with a corresponding ledge of said walls;

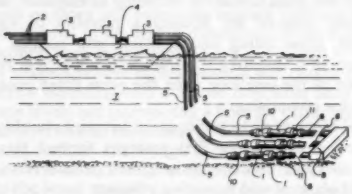
said base member and said strain relief cover being made in great lengths and cut to a length containing the desired number of contact receiving passages.

4,050,765

UNDERWATER CABLE CONNECTOR ASSEMBLY

William C. Duesterhoeft, Austin, and James E. McClain, Greenville, both of Tex., assignors to Esco Manufacturing Company, Greenville, Tex.

Filed Aug. 30, 1976, Ser. No. 718,790
Int. Cl.[2] H01R *3/04*
U.S. Cl. 339—117 R **13 Claims**



1. Electrical cable connector assembly, comprising:

a. male connector means comprising an elongated body of insulating material with a conductive rod axially extending therethrough, one end of said conductive rod adapted to be joined with the conductive end of a first insulated power cable, the opposed end of said conductive rod terminating in a prong assembly,

b. female connector means adapted for mateable coupling with said male connector means, said female connector means comprising a hollow insulating sleeve defining an elongated chamber therein and adapted to telescopically receive the elongated body of said male connector means at one open end thereof, means adapted to be joined with the conductive end of a second insulated power cable, and conductive socket means disposed within said hollow insulating sleeve at a location remote from said one open end adapted to receive said prong assembly in conductive coupling relationship, and

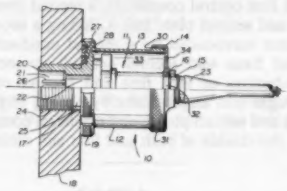
c. means connected with said male connector means for establishing an indirect fluid path through said elongated chamber between said open end and the situs of conductive coupling of said prong assembly and said conductive socket means, whereby fluid exiting said chamber at said open end when said male and female connectors are mateably coupled is constrained to travel along said indirect fluid path.

4,050,766

CORROSION-PROOF ELECTRICAL CONNECTOR ASSEMBLY

Graeme N. Dennison, Saanichton, Canada, assignor to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence, Ottawa, Canada

Filed Aug. 23, 1976, Ser. No. 716,681
Claims priority, application Canada, Apr. 9, 1976, 249932
Int. Cl.[2] H01R *3/04*
U.S. Cl. 339—117 P **23 Claims**



1. A housing for a corrosion-proof electrical connector having first and second mating members interconnecting electrical conductors in a pressurized environment, the housing comprising:

container means having walls defining a substantially liquid-tight, rigid chamber adapted to receive the electrical connector, a closed end including a first passage therethrough for admitting a first conductor to the first mating member, and a cappable open end;

a rigid cap closing the open end, the cap including a second passage therethrough for admitting a second conductor to the second mating member;

locking means disposed on the cap and closed end for retaining said members in locked mating relation when the open end is capped;

a dielectric liquid substantially inert to the environment and filling the rigid chamber to at least immerse the mating portions of said members; and

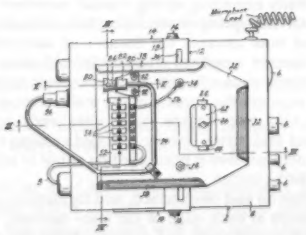
a bleed hole disposed in the housing for directly communicating the environment to said liquid for pressure balancing the housing and pressure sealing the immersed portions of said members.

4,050,767

AUTOMOBILE MOUNT FOR CITIZENS BAND RADIOS

Keith E. Berning, R.R. No. 1, Cosby, Mo. 64436

Filed Aug. 5, 1976, Ser. No. 711,868
Int. Cl.[2] H01R *17/18*
U.S. Cl. 339—135 **7 Claims**



1. A radio mount for automobiles comprising:

a. a first plate,

b. means for mounting said first plate rigidly in an automobile,

c. a second plate, said second plate being slidably engageable with and disengageable from said first plate,

d. means rigidly affixing said second plate to the case of a radio, and

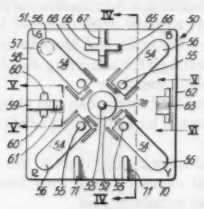
e. a series of pairs of electrical contacts, the contacts of each pair being mounted respectively on said first and second plates and being positioned to be brought into engagement by sliding engagement of said first and second plates, each of said pairs being operable when engaged to complete an electrical connection from said automobile to said radio, one of said connections being from an antenna mounted on said automobile to the antenna input connection of said radio case, and comprising a first connector mounted on said first plate and constituting a first central conductor surrounded by a first conducting shield separated from said first central conductor, a second connector mounted on said second plate and including a second central conductor surrounded by a second conducting shield separated from said second central connector, the central conductors of said first and second connectors being brought into engagement by sliding engagement of said first and second plates, and electrical connections grounding the shields of both said first and second connectors.

4,050,768

INTERCONNECTOR FOR ADAPTING EXISTING TELEPHONE OUTLETS TO PLUG-IN OUTLETS

Beverley William Gumb, London, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Aug. 16, 1976, Ser. No. 714,632
Int. Cl.[2] H01R *31/06*
U.S. Cl. 339—154 A **3 Claims**



1. A common interconnector for adapting either of two forms of existing telephone outlets for telephone sets, the outlets each having screw terminals for attachment of conductors of the telephone system and the telephone sets connected to the outlets by plugs having a number of pins or by direct wiring to said terminals, said interconnector adapting said outlets to a form having a profiled aperture for accepting a profiled plug of a plug-in telephone unit and comprising:

a flat square main member having two opposed parallel surfaces;

a central boss extending from one of said parallel surfaces and a bore through said central boss;

four radially extending spring contact members on said one surface, said spring contact members extending from said central boss towards the corners of said main member, said contact members attached to said main member at their inner ends adjacent to said boss and including outer ends adjacent the corners of the main member and spaced from said one surface, said outer ends positioned to contact said screw terminals in said existing outlets when said main member is positioned on either of said two forms of existing outlet;

formations on said one surface, said formations comprising a formation at each edge of the main member, each formation of unique form and differing from the other of said formations, and adapted to interengage with existing formations at the periphery of the existing outlets, to provide a predetermined rotational relationship between the main member and the existing outlets independent of the particular one of said two existing outlets;

means for attaching said main member to an outlet;

a hollow snap-on cover fitting over said main member, said cover of rectangular form having four sides, three sides form a close fit over three sides of said main member, a transverse wall extending laterally across the interior of the cover, said transverse wall forms a close fit over the fourth side of said main member, said cover extending beyond said main member to form an extension bounded by a fourth side of said cover;

a jack positioned in said extension, said jack including contacts connected to said spring contacts on said main member; and

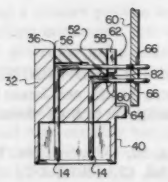
an aperture in said fourth side of said cover, said aperture having a predetermined profile for acceptance of a profiled plug therein, said aperture aligned with said jack to permit the spring contacts on said plug to engage said contacts in said jack.

4,050,769

ELECTRICAL CONNECTOR

J. Preston Ammon, Dallas, Tex., assignor to Elfab Corporation, Dallas, Tex.

Filed Mar. 18, 1976, Ser. No. 667,963
Int. Cl.[2] H01R *13/42, 13/46*
U.S. Cl. 339—196 M **2 Claims**



1. An electrical connector including an insulator, said insulator being adapted for housing a plurality of right angle contacts, press fitting said contacts into contact receiving apertures in a mounting substrate, and subsequent removal of one part of the insulator from the press fitted contacts, said connector comprising:

a first block of dielectric material having a plurality of linear sleeves comprising first passages formed therethrough with upper inside walls in spaced parallel relationship to the plane of said mounting substrate for receiving in slip-fit engagement a first linear portion of said right angle contacts, each of said linear sleeves also including second orthogonal passages having an inside face bounded on each side by upwardly projecting ribs which passages receive a second linear portion of said right angle contacts and which ribs support the second linear contact portions from transverse or twisting movement during subsequent contact press fitting;

a plurality of contact terminals having first and second linear portions formed into a generally right angle configuration with one another, said first linear terminal portions being received through said first passages and said second linear terminal portions lying upon the inside faces of said second passages and between adjacent ones of said upwardly projecting ribs;

a second block of dielectric material in mating engagement with said first block of dielectric material and having a plurality of linear passages formed therein and having second linear terminal portions protruding therethrough; and

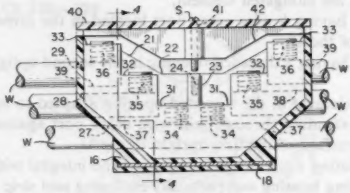
said first and second blocks further adapted to hold said contacts in said passages and between said abutting blocks to effect press fitting said second linear terminal portions into the apertures in said substrate when a downward force from said insulator to said contacts through the engagement of abutting surfaces between said first linear passages and said first linear terminal portions.

4,050,770

JUNCTION BOX TERMINAL BLOCK

Larry E. Rigo, P.O. Box 805, Marietta, Ga. 30061

Filed Oct. 18, 1976, Ser. No. 732,843
Int. Cl.² H01R 9/10
U.S. Cl. 339—198 G 6 Claims



1. A terminal block for mounting across the width of a junction box trough for terminating wires extending into the trough, each terminal block comprising:

an insulated housing of width selected to fit within the width of the trough, the housing having lengthwise-extending partitions dividing it into side-by-side lug receiving recesses extending the full length of the housing and extending into the depth of the block toward its bottom from its exposed upper surface;

a conductive terminal lug in each recess, each lug extending the full length of a recess and being inwardly stepped along the length of the lug from a first level near the upper surface of the housing at each end to a recessed level at the central portion of the lug to provide multiple different levels of exposed surfaces located adjacent to each other;

the housing and each of the lugs having wire receiving bores opening through both sides of the housing toward said central portions and extending beneath different surface levels parallel to the length dimensions of the lugs, each uppermost bore ending beneath one of said first levels and each lowermost bore ending beneath said central portion;

a set screw extending into a tapped hole from each of said surface levels and intersecting a bore for clamping a wire in the bore, and all the set screws being accessible from the exposed surfaces of the lugs; and

the transverse ends of each recess and the transverse ends of each lug being shaped to converge toward said central portion from a level beneath said uppermost bore to the bottom of the lug and the recess of the housing, thereby to shorten the length of the lower portion of the lug and of the lowermost bores beneath said central portion.

4,050,771

THREADED TERMINAL ASSEMBLY FOR DYNAMOELECTRIC MACHINE

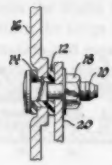
Richard D. Watson, Chesterfield, and Thomas R. Sowash, Anderson, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed July 1, 1976, Ser. No. 701,639
Int. Cl.² H01R 7/08
U.S. Cl. 339—263 R 2 Claims

1. A threaded terminal assembly for a dynamoelectric machine having a slotted frame member,

a unitary insulating grommet member having a pair of washer portions spaced by a distance greater than the thickness of the frame member and connected by a central sleeve portion of square cross section for a sliding non-rotatable fit into the slotted frame member with the washer portions loosely overlying opposed surfaces of the frame member, one of the washer portions being connected to the sleeve through a yieldable web member so that upon application of axial force to the grommet during assembly the web member will yield to conform the washer spacing to the frame thickness,

a square shanked bolt held securely within the grommet by an interference fit between the bolt shank and the interior of the sleeve portion whereby the bolt is non-rotatably mounted to the frame member and insulated therefrom



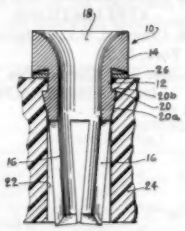
and is at least temporarily held firmly in such mounted position prior to attachment of a nut to the bolt for complete assembly.

4,050,772

UNITARY SOCKET TERMINAL FOR ELECTRONIC CIRCUITS

Jean Birnholz, and Pierre Couty, both of 1870 Monthey Valais, Monthey, Switzerland

Continuation-in-part of Ser. No. 638,939, Dec. 8, 1975. This application Jan. 26, 1976, Ser. No. 652,462
Claims priority, application Switzerland, May 21, 1975, 6499/75
Int. Cl.² H01R 9/12, 9/14; H05K 1/12
U.S. Cl. 339—220 R 6 Claims



1. A unitary socket terminal for electronic circuits and connections, comprising:

a. a cylindrical tubular body having a circumferentially continuous inner wall which defines a cylindrical inner chamber,

b. a cylindrical tubular head, larger in diameter than the tubular body, formed at the upper end of said tubular body,

c. said tubular head having a circumferentially continuous inner wall which defines a funnel-shaped orifice whose smaller end communicates with said inner chamber,

d. said inner wall in said tubular head curving smoothly into said inner wall in the tubular body to form a continuous lead-guiding surface,

e. a downwardly facing annular shoulder formed on said tubular head,

f. said annular shoulder being adapted to engage a circuit or connecting element which encircles the tubular body, and

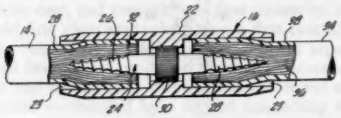
g. lead-gripping means formed at the lower end of the tubular body to engage a lead guided thereinto.

4,050,773

BATTERY TERMINAL CONNECTOR

Carl W. Newell, 940 Allen Ave., Glendale, Calif. 91201

Filed Mar. 24, 1976, Ser. No. 670,086
Int. Cl.[2] H01R 11/20, 11/26
U.S. Cl. 339—224 3 Claims



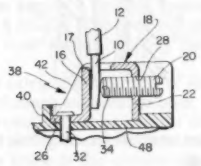
1. A connector assembly for providing a non-corrosive coupler for a battery cable, said assembly comprising a coupling member constructed of a lead alloy and being adapted to be secured to a battery terminal, an electrical cable, one end of said battery cable being secured to said coupling member, and a connector assembly for securing and electrically communicating said electrical cable to said battery cable, said assembly being comprised of a threaded contact member constructed of an electrically conductive material and a rigid housing constructed of an insulating material and disposed about said threaded contact member, said contact member having a pair of threaded screw portions extending along a common longitudinal axis in opposite directions from a common head portion, one of said screw portions being in threaded engagement with the wires comprising said cable and the other of said portions being adapted for threaded engagement with the wires comprising said battery cable whereby said cable and said battery cable can be held in electrical communication by said screw portions of said contact member.

4,050,774

CAP AND CONNECTOR FOR FIVE-WIRE APPLICATIONS

Luther M. Sheldon, Cranston, R.I., assignor to General Electric Company, New York, N.Y.

Filed June 30, 1976, Ser. No. 701,062
Int. Cl.[2] H01R 7/12
U.S. Cl. 339—264 R 1 Claim



1. A wiring device for connection to a plurality of wires of an electric cable comprising

an insulating housing of generally cylindrical form,

electrical contacts at least partially within said housing,

said contacts being adapted to receive at an inner end portion thereof electrical conductors of a multiconductor cable,

said contacts being adapted to mate at the other end portion thereof with complimentary contacts of another wiring device,

one of said contacts being made up at its inner end of a strip portion and at its outer end of an elongated element of generally rod like configuration,

the elongated element extending along the axis of the cylindrical housing,

the strip portion of said contact being attached at the inner end of said elongated element and extending in a generally radial direction from said element,

the strip portion of said contact being in the form of an inverted "U" having a first and a second upright and a cross element and having a side arm extending from the end of the first upright of the "U",

the strip portion being attached at its side arm to the inner end of the elongated element,

the strip having a wire entry port located in the cross element of the U,

the strip having a threaded opening in the second upright of the U,

a screw element in the threaded opening adapted to urge a wire extending through said wire entry port against the inner surface of the first upright of the U,

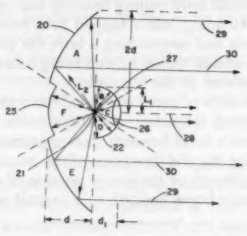
and insulating walls extending up from and integral with the insulating housing and partically enclosing said strip at its sides and side arm and contacting the free ends of the strip to prevent separation of said first and second uprights.

4,050,775

CATOPTRIC LENS ARRANGEMENT

James R. Scholten, Wayland, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 26, 1976, Ser. No. 708,668
Int. Cl.[2] G02B 17/06, 5/10
U.S. Cl. 350—200 10 Claims



1. A catoptric lens system for focusing a maximum amount of light from an omnidirectional source into a parallel beam comprising:

a set of spherical reflectors disposed symmetrically in opposed reflective relationship along a common system axis, said surfaces having a common center and unequal radii;

a parabolic reflector symmetrically disposed in said system with said center as its focal point and having its reflective surface replaced in part by said spherical reflector having the greatest radius,

said spherical reflector having the lesser radius hemispherical in extent,

a collimating lens symmetrically disposed in said spherical reflector of lesser radius replacing in part its reflective surface; and

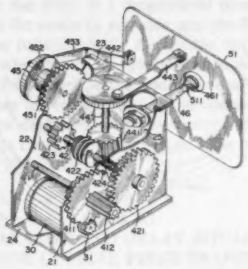
a substantially point source of light positioned at said center,

whereby all light from said source is collimated and emanates from said system either directly through said lens, by reflection and re-reflection from said spherical and parabolic reflectors, or directly from said parabolic reflector.

4,050,776
ELECTRIC-POWERED ADJUSTABLE REAR-VIEW MIRROR FOR VEHICLES WITH DISENGAGEABLE WORM GEAR

Ming Ching Hsu, 97-2, Lane 39 Jen Hsing Street, San Chung Shih, Taiwan, China /Taiwan

Filed Aug. 25, 1975, Ser. No. 607,588
Int. Cl.² G02B *7/18*
U.S. Cl. 350—289 **2 Claims**

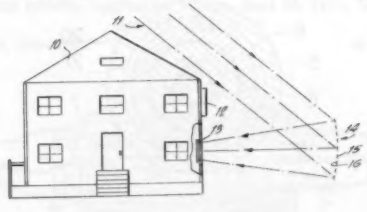


1. A universally adjustable mirror comprising a mirror, a support for mounting said mirror for universal movement with respect to a fixed member, a two directional D.C. motor, a shaft rotatable about its axis and movable longitudinally with respect to said axis, gear means for rotating said shaft in accordance with the direction of rotation of said two directional motor, a worm gear mounted on said shaft, a first transmission disc operatively connected to and rotatable by said worm gear when said motor rotates in one direction, a first linkage means connected to said first transmission disc for reciprocally turning said mirror about a first axis, a second transmission disc, a second linkage means connected to said second transmission disc for reciprocally turning said mirror about a second axis substantially perpendicular to the first axis, a driving gear mounted on said shaft for driving said second transmission disc said worm gear operating to move said shaft longitudinally upon rotation of said shaft by rotation of said motor in the opposite direction thereby causing disengagement of said worm gear from said first transmission disc, biasing means for normally urging said worm gear into engagement with said first transmission disc and means for controlling the direction of rotation of said two directional motor.

4,050,777
SOLAR ENERGY REFLECTING APPARATUS WITH YIELDABLY BIASED REFLECTORS

Melville F. Peters, Livingston, N.J., assignor to Walter Todd Peters; Margot Elizabeth Peters and Albert F. Kronman, all of East Dennis, Mass.

Filed Dec. 17, 1976, Ser. No. 751,844
Int. Cl.² G02B *5/08;* F24J *3/02*
U.S. Cl. 350—292 **11 Claims**

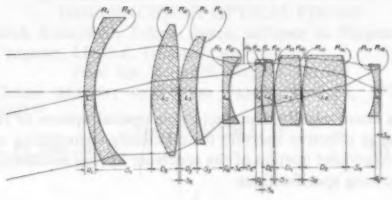


1. Solar energy reflecting apparatus comprising a frame, a plurality of elongated strips carried by said frame, at least one light reflecting major face on each strip, elongated margins on each strip disposed in side by side orientation with next adjacent strip margins, said light reflecting major faces oriented to form a light reflecting panel, at least one shaft secured to each strip and extending axially and outwardly thereof, bores in the frame to freely receive the free ends of the shafts therethrough, means to yieldably restrain the shafts from turning within the frame bores, means to return the strips to their reflecting orientation in the event of rotation and means to tilt and swing the frame to effect both diurnal and seasonal tracking of the sun.

4,050,778
ULTRA-VIOLET MICROGRAPHIC OBJECTIVE

Andor A. Fleischman, Northbrook, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Aug. 10, 1976, Ser. No. 713,320
Int. Cl.² G02B *13/14, 9/64*
U.S. Cl. 350—2 **1 Claim**



1. An economically manufacturable optical system of relatively large effective aperture for efficiently transmitting rays in the ultra-violet portion of the spectrum, the optical system having substantially the following specifications:

EFL = 1.1751 inches (29.85 mm)
Half Angle of Field = 12.15°

Lens	Radii(in.)		Thickness(in.)	spacing (in.)	N_D	V
L_1	R_1 =	1.7850	D_1 = .1400		1.691	54.7
	R_2 =	−1.1450		S_1 = .6410		
L_2	R_3 =	1.4440	D_2 = .3200		1.691	54.7
	R_4 =	7.2120		S_2 = .0050		
L_3	R_5 =	1.0360	D_3 = .1970		1.691	54.7
	R_6 =	−1.9500		S_3 = .2890		
L_4	R_7 =	−30.0003	D_4 = .0700		1.689	31.2
	R_8 =	−.6300		S_4 = .1760		
		— STOP —		S_5 = .1380		
L_5	R_9 =	120.0480	D_5 = .0700		1.717	29.5
	R_{10} =	−1.1450		S_6 = 0		
L_6	R_{11} =	1.1450	D_6 = .1400		1.734	51.7
	R_{12} =	15.0900		S_7 = .0050		
L_7	R_{13} =	1.1210	D_7 = .3150		1.691	54.7
	R_{14} =	27.1732		S_8 = .0050		
L_8	R_{15} =	1.2920	D_8 = .4990		1.691	54.7
	R_{16} =	2.6603		S_9 = .3240		
L_9	R_{17} =	−0.6160	D_9 = .0550	S_{10} = .0094 (BFL to FILM PLANE)	1.498	67.1
	R_{18} =	Inf.				

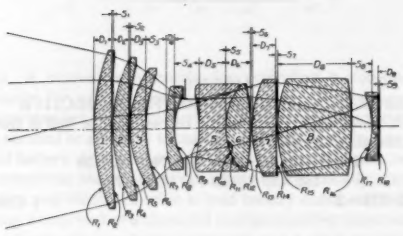
wherein the first column lists the lens elements numerically starting at the ray entrance side of the system; the second column lists the respective base radii R_1 to R_{18}; the third column lists the thicknesses of the respective elements; the fourth column lists the axial spacings S_1 to S_{10} between respective elements; and the fourth and fifth columns list respectively the refractive index and the dispersive index of the optical material.

4,050,779

ULTRA-VIOLET MICROGRAPHIC OBJECTIVE

Andor A. Fleischman, Northbrook, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Aug. 10, 1976, Ser. No. 713,321
Int. Cl.[2] G02B 9/64, 13/14
U.S. Cl. 350—2 1 Claim



1. An economically manufacturable optical system of relatively large effective aperture for efficiently transmitting rays in the ultra-violet portion of the spectrum having substantially the following specifications:

TABLE 1

EFL = 1.3039 inches (33.11 mm)
Half Angle of Field = 12.55°

Lens	Radii(in.)	Thickness (in.)	Spacing (in.)	N_D	V
L_1	R_1=2.3320			1.697	55.4
	R_2=−9.9876	D_1=.1709			
			S_1=.005		
L_2	R_3=1.5523			1.697	55.4
	R_4=−3.2894	D_2=.1657			
			S_2=.005		
L_3	R_5=1.0150			1.697	55.4
	R_6=−1.4557	D_3=.1541			
			S_3=.2064		
L_4	R_7=2.0378			1.646	34.1
	R_8=−0.5897	D_4=.0720			
			S_4=.1212		
	---------- STOP ----------				
			S_5=.1436		
L_5	R_9=1.2414			1.650	39.2
	R_{10}=−0.6660	D_5=.2529			
L_6	R_{11}=0.6660			1.697	55.4
	R_{12}=1.8960	D_6=.2534			
			S_6=.006		
L_7	R_{13}=1.0624			1.651	55.9
	R_{14}=−10.9941	D_7=.2452			
			S_7=.005		
L_8	R_{15}=1.2749			1.651	55.9
	R_{16}=4.6676	D_8=.7357			
			S_8=.2085		
L_9	R_{17}=−0.6787			1.498	67.1
	R_{18}= Inf.	D_9=.0600			
			S_9=.0051 BFL		

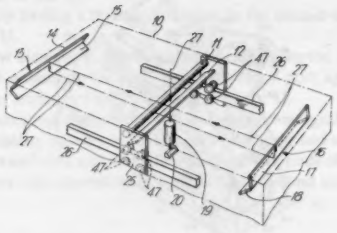
wherein the first column lists the lens elements numerically starting at the ray entrance side of the system; the second column lists the respective base radii R_1 to R_{18}; the third column lists the thicknesses of the respective elements; the fourth column lists the axial spacings S_1 to S_9 between respective elements; and the fourth and fifth columns list respectively the refractive index and the dispersive index of the optical material.

4,050,780

OPTICAL SYSTEM FOR A SCANNING APPARATUS WITH REFLECTOR PAIRS AT EACH END

John Shi Sun Wei, and William Dickson Westwood, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Nov. 8, 1976, Ser. No. 740,067
Int. Cl.[2] G02B 27/17; G03B 27/70
U.S. Cl. 350—6 9 Claims



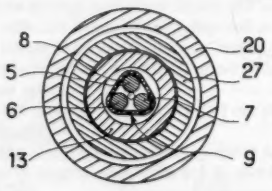
1. An optical system for a scanning apparatus, comprising;
an elongated housing;
a first mirror mounted in said housing for reciprocal movement therein for scanning of material positioned on said housing;
second and third mirrors mounted at one end of said housing, the second mirror optically aligned with said first mirror for reception of light rays therefrom and for reflection rays to said third mirror;
fourth and fifth mirrors mounted at the other end of said housing, the fourth mirror optically aligned with the third mirror for reception of said rays therefrom and for reflection of said rays to the fifth mirror;
a sixth mirror intermediate the ends of the housing and optically aligned with the fifth mirror for reception of said rays therefrom, the path of said rays from said sixth mirror extending to a lens system and then to an image receiver;
the sixth mirror mounted for reciprocal movement in said housing at a predetermined speed relationship with said lamp and first mirror, to maintain constant the total optical path length from said first mirror to said lens system.

4,050,781

CONNECTOR FOR OPTICAL FIBERS

Pierre Beauhaire, Meudon-la-Foret, France, assignor to Societe Anonyme dite: Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Nov. 10, 1975, Ser. No. 630,644
Claims priority, application France, Nov. 13, 1974, 74.37420
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96 C 9 Claims



1. A connector for optical fibers comprising a pressing assembly including three rollers and a flexible sheath surrounding said rollers and applying perssure thereto for pressing said rollers against a pair of optical fibers placed end to end in the interior of the rollers, said rollers extending parallel to one

another in equally spaced relation to define a bore with a central longitudinal axis in which the optical fibers can be aligned and held in alignment, said rollers having tapered ends to form flared openings at the respective ends of the assembly of rollers, first and second cones disposed at the respective ends of the assembly of rollers and engaged in said flared openings, each cone having a central bore for the passage of a respective fiber therethrough and into the bore of the assembly of rollers, and means for relatively moving one of said cones with respect to the other in a longitudinal direction to selectively cause (a) the cones to advance into the flared openings and displace the rollers radially against the opposition of said flexible sheath whereby to enlarge the bore in the roller assembly and permit free insertion and removal of said optical fibers and (b) the cones to retract in the flared openings and permit the rollers to be displaced inwardly under the action of the flexible sheath to clamp the rollers against the optical fibers in the bore of the roller assembly.

4,050,782

MODE SEPARATOR AND DELAY EQUALIZER FOR MULTIMODE OPTICAL FIBER TRANSMISSION SYSTEMS

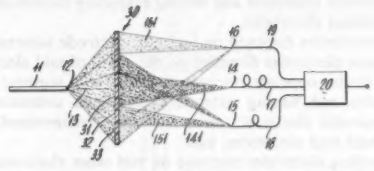
Teiji Uchida, and Atsufumi Ueki, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Apr. 20, 1976, Ser. No. 678,636

Claims priority, application Japan, Apr. 21, 1975, 50-54324[U]

Int. Cl.² G02B 5/14, 3/08

U.S. Cl. 350—96 C **9 Claims**



1. For use with an optical fiber transmission line, a light-mode separator located adjacent to said fiber end in a plane perpendicular to said fiber axis comprising: an array of concentric, circular, light-converging regions, each having a different optical axis and dimensioned to focus, within different ranges of angles, wave energy radiated at the end of said fiber, wherein each of the focusing points of the respective light-converging regions is located outside of other conical converging light rays formed by other converging regions.

4,050,783

CONNECTOR FOR AN OPTICAL FIBRE LINK

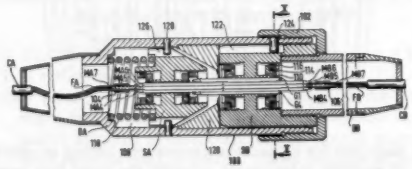
Andre Tardy, St. Germain les Arpajon, France, assignor to Compagnie Generale d'Electricite, Paris Cedex, France

Filed June 17, 1975, Ser. No. 587,785

Claims priority, application France, June 20, 1974, 74.21506

Int. Cl.² G02B 5/14

U.S. Cl. 350—96 C **14 Claims**



1. In a connector for axially connecting optical fibre elements, said connector comprising:

at least one optical fibre element and constituting a light guide;

and guide means for guiding an end section of that one fibre element axially to a position ensuring the connecting thereof to another axially aligned optical fibre element; the improvement comprising:

at least three holding rods which have the shape of cylinders of revolution;

clamping means for keeping these holding rods parallel to one another and in contact by their lateral surfaces and forming together, an optical fibre holding channel limited by adjacent portions of the lateral surfaces of these rods;

and wherein said end section of said one fibre element is arranged in that holding channel, whereby said clamping means provides contact of all rods with that one fibre element without substantially deforming the latter and wherein said guide means includes surface portions engaging said holding rods to guide said one fibre element accurately and without any danger of damage axially to the position ensuring axially aligned connection thereof to said other optical fibre element.

4,050,784

LIGHT BEAM COUPLER FOR AXIALLY DISCOINCIDENT OPTICAL FIBERS

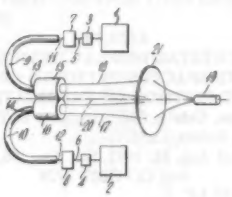
Kohroh Kobayashi, Tokyo, Japan, assignor to Nippon Selfoc Company, Limited, Tokyo, Japan

Filed Apr. 29, 1976, Ser. No. 681,806

Claims priority, application Japan, Apr. 30, 1975, 50-59291[U]

Int. Cl.² G02B 5/14

U.S. Cl. 350—96 C **10 Claims**



1. A light-beam coupler for optical fibers comprising; a group of elongate light-transmission bodies each having a generally central axis about which the refractive index decreases approximately proportional to the square of the distance from said axis, and each of said bodies being adapted to magnify the diameter and to limit axial deviation of a light beam entering at one axial end, said bodies being installed adjacent to each other with their said axes in closely spaced relation; a plurality of optical fibers each of which is coupled to a different one of said light-transmission bodies at one of the ends of said group; a single optical fiber having one end installed in spaced relation to the other end of said group and on an optical axis parallel to the axes of said light-transmission bodies, and an optical lens interposed between said group of light-transmission bodies and said single optical fiber; said end of said single optical fiber being disposed near the focal plane of said optical lens.

4,050,785

SPECTACLE FRAMES

Bernard Auge, 7, rue Poncelet, 75017 Paris, France

Filed Feb. 21, 1975, Ser. No. 551,550

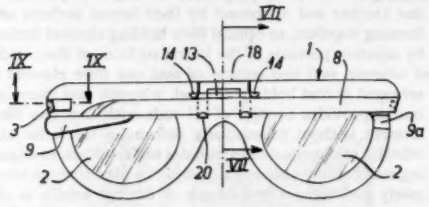
Claims priority, application France, Feb. 27, 1974, 74.06618

Int. Cl.² G02C 5/14, 5/22

U.S. Cl. 351—120 **8 Claims**

1. In a frame for spectacles comprising a substantially flat front part in which two lenses are mounted, and two temples pivotally connected to said front part by means of hinges

located at opposite sides of the front part, said hinges lying between the planes containing the front and rear surfaces of the front part of the spectacles, said temples having a main part made of a thin material terminating in thicker free ends, and means for holding the thin parts of the temples against the rear surface of the front part of the spectacles when in folded position, the improvement according to which each hinge has a



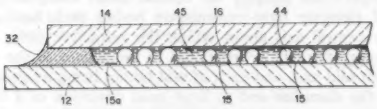
pivotal axis at a fixed acute angle to the axis of symmetry of said spectacles, with the upper end of said pivotal axis further from said axis of symmetry than its lower end, and the end of each temple is offset with respect to the rest of the temple in a direction parallel to the axis of the corresponding hinge by a distance substantially equal to the width of the main part of the temple adjacent said hinge.

4,050,786

LIQUID CRYSTAL DISPLAY DEVICE HAVING PARTICULATE SPACERS IN LIQUID CRYSTAL AREA AND METHOD OF FABRICATION

Bernard Feldman, Goleta, Calif., assignor to Transparent Conductors, Inc., Goleta, Calif.

Filed Aug. 31, 1971, Ser. No. 176,633
Int. Cl.[2] G02F *1/28*
U.S. Cl. 350—160 LC **11 Claims**



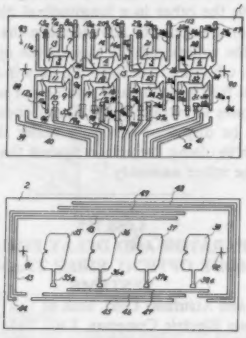
1. A display for containing electro-optic material in a layer of controlled thinness comprising:
first and second substrates;
a pattern of electrical conductors associated with each of said first and second substrates;
said first and second substrates being positioned to define a predetermined separation therebetween and having:
a plurality of support particles in the region between said first and second substrates;
said plurality of support particles being in generally isolated distribution throughout a substantial portion of the region between said first and second substrates including regions intermediate the peripheries of said first and second substrates;
said plurality of support particles being bonded to each of said substrates to provide a rigid physical interconnection between said first and second substrates;
said support particles thereby defining the predetermined separation between said substrates; and
an electro-optic material in the region between said first and second substrates.

4,050,787

ELECTROOPTIC DISPLAY DEVICE

Masanori Fujita, Matsudo, and Sukenori Suzuki, Narashino, both of Japan, assignors to Kabushiki Kaisha Seikosha, Japan

Filed Feb. 4, 1975, Ser. No. 546,899
Claims priority, application Japan, Feb. 4, 1974, 49-14274
Int. Cl.[2] G02F *1/16*
U.S. Cl. 350—160 LC **3 Claims**



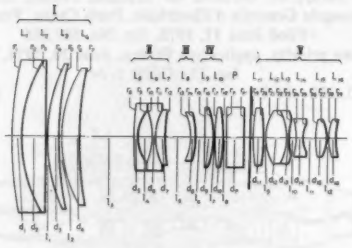
1. An electrooptic display device comprising:
two spaced-apart and opposing electrode substrates which define therebetween an interspace hermetically containing therein a substance having an electrooptic effect;
a plurality of segment electrodes disposed on one of said electrode substrates and having extending therefrom segmentlead electrodes;
lead electrodes disposed on said one electrode substrate;
common electrodes disposed on the other of said electrode substrates opposite respective ones of said segment electrodes and having extending therefrom common-lead electrodes electrically connected to predetermined ones of said lead electrodes; and
connecting electrodes disposed on said other electrode substrate and electrically connected to predetermined ones of said segment-lead electrodes and said lead electrodes thereby commonly connecting them together.

4,050,788

BASIC LENS FOR PANCRATIC SYSTEM

Irmgard Wendisch, Trumau, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Nov. 18, 1975, Ser. No. 633,088
Claims priority, application Austria, Nov. 18, 1974, 9242/74
Int. Cl.[2] G02B *15/00*
U.S. Cl. 350—184 **3 Claims**



1. A basic lens for a pancratic camera lens having an afocal screen of variable enlargement wherein the basic lens comprises a plurality of lenses including a first biconvex lens nearest the object to be photographed, a second biconvex lens, a first biconcave lens cemented to said second biconvex lens, a

second biconcave lens, a third biconvex lens and a positive meniscus all arranged in an aligned relationship as viewed in the direction of the incident light, wherein the positively refracting surfaces (Φ21, Φ28) of said second biconvex lens cemented to said first biconcave lens and the positive meniscus, said positively refracting surfaces (Φ21, Φ28) convex to the incident light, the positively refracting surface (Φ27) of the third biconvex lens, said positively refracting surface (Φ27) convex to the picture, as well as the negatively refracting surface (Φ25) of said second biconcave lens, said negatively refracting surface (Φ25) concave to the picture, have the following values:

$$\Phi 21 + \Phi 27 + \Phi 28 = 3.14, 2$$

and

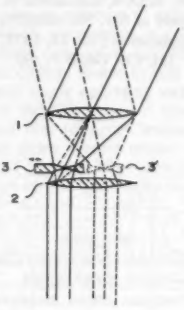
$$\Phi 25 = -1.62.$$

4,050,789

TRACKING LENS SYSTEM FOR SOLAR COLLECTORS AND SKYLIGHTS

Edward Herbert, Rte. 44, Canton, Conn. 06019

Filed Apr. 15, 1976, Ser. No. 677,153
Int. Cl.² G02B *9/16, 7/02;* F24J *3/02*
U.S. Cl. 350—226 **2 Claims**



1. A tracking lens system capable of tracking incident sunlight over any small angle, comprising

a condensing lens

a diverging lens, the diverging lens forming a compound lens with the condensing lens such that the focal point of the compound lens is virtual, and is located at the condensing lens,

position means to move the diverging lens so that the center of the diverging lens intercepts the axis of the incident sunlight beam, and

additional focusing means to concentrate the sunlight upon a focal point.

4,050,790

SELF-STYLING AND UTILITY MIRROR WITH FOUR SURFACES

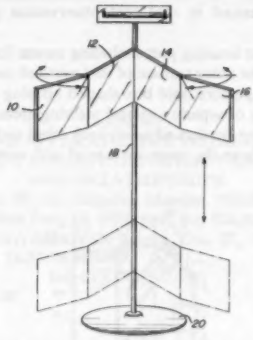
Mildred M. Jorwa, 71 Lincoln Ave., Fair Lawn, N.J. 07410

Filed Nov. 14, 1975, Ser. No. 631,898
Int. Cl.² G02B *5/08*
U.S. Cl. 350—305 **3 Claims**

1. A self-styling utility mirror comprising:

four planar mirrored surfaces contiguous at the vertical edges thereof, said surfaces comprising two inner surfaces fixedly attached to each other at said vertical edges, said inner surfaces lying in vertical planes disposed at an angle ranging from 80 - 130° with respect to each other, and two outer surfaces located in rotatable hinged attachment to respective inner surfaces and adapted for horizontal rotation about the vertical axis defined by said hinged attachment;

a vertical support structure having a weighted base; and



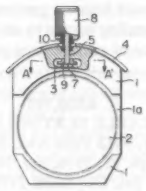
means for attachment of said mirror to said vertical support to enable the omni-directional movement of said mirror with respect to said support.

4,050,791

FILTER HOLDER INSERTABLE INTO THE LENS BARREL OF A CAMERA

Sataya Watanabe, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Dec. 19, 1975, Ser. No. 642,543
Claims priority, application Japan, Dec. 28, 1974, 50-1393
Int. Cl.² G02B *7/00;* G03B *17/00;* G02B *7/02*
U.S. Cl. 350—318 **9 Claims**



1. In combination, a lens barrel of a camera and a filter holder, the filter holder comprising a body for carrying a filter, the body having a slot; the lens barrel having a guide member comprising a pair of walls spaced apart a distance to slideably receive said body; an engaging member disposed in the slot and mounted on the body for rotation between first and second positions; and retaining means on the engaging member having a retracted position when the engaging member is in its first position to enable insertion of the holder between said walls, and having an extended position projecting beyond the body when the engaging member is in its second position, at least one of said walls having an aperture to receive said retaining means when the engaging member is in its second position.

4,050,792

OBSERVATION PORT ASSEMBLY

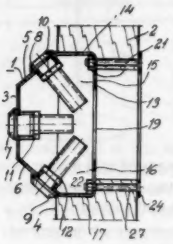
Ulf Svensson, Malmkoping, Sweden, assignor to Roger Ronny Jochen Svensson, Stockholm, Sweden

Filed Jan. 29, 1976, Ser. No. 653,609
Claims priority, application Sweden, Mar. 12, 1975, 7502788
Int. Cl.² G02B *5/00, 25/04*
U.S. Cl. 350—319 **5 Claims**

1. An observation port assembly in combination with a vertical panel, such as a door or the like and in which said vertical panel includes inner and outer vertical surfaces, said

vertical panel having a through-aperture in which said observation port assembly is mounted for permitting an observer, at the inner surface of the vertical panel, to unobtrusively observe the area at the outer surface of the vertical panel, the improvement characterized in that said observation port assembly comprises:

a box-shaped housing part including means for fixed attachment to the outer surface of said vertical panel and in said through aperture, said box-shaped housing part including a plurality of separate optical viewing elements each having viewing-oculars adjacent each other and accessible for viewing from the inner surface of said vertical panel, the



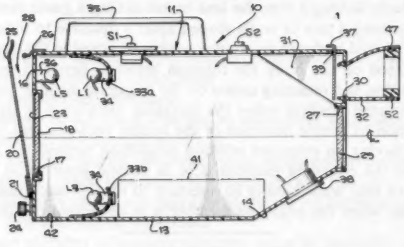
separate optical viewing elements having a linear optical axis at a predetermined angular relationship to the linear optical axis of an adjacent optical viewing element, the box-shaped housing part including a portion projecting beyond the outer surface of said vertical panel and comprising diverse surface portions in which said viewing elements are fixedly mounted, said housing part having an inner wall, and fastening means extending from said inner wall of said housing part and the inner surface of said vertical panel, said housing part enclosing said fastening means and preventing access to said fastening means from the outer surface of said vertical panel.

4,050,793

PORTABLE SLATING DEVICE

Howard W. Hoadley, 9413 Petit Ave., Sepulveda, Calif. 91343

Filed Feb. 17, 1976, Ser. No. 658,340
Int. Cl.[2] G03B *21/32*
U.S. Cl. 352—5 **8 Claims**



1. A portable slating device for use with a movie camera having a lens, a film, and a separate sound recorder, said device comprising:

a light-tight housing having a lens on the front end and a copyholder on the back end thereof for holding an opaque record medium having information on the face thereof of a size as provided by a conventional typewriter,

a source of electrical energy,

light bulbs in said housing connected to said source of electrical energy and positioned for illuminating the face of the record medium so that the information thereon can be photographed,

a synchronizing light bulb located in said housing,

an audio signal means mounted on the wall of said housing, and

circuit means connected to said source of electrical energy and including a switch attached to the wall of said housing which when closed provides for momentarily simultaneously energizing said synchronizing light bulb and said audio signal means,

whereby when the front end of said housing is positioned adjacent the lens of the camera operating at sound speed for the housing lens functions as a supplementary close-up lens which cooperates with the camera lens to sharply focus the information on the opaque record medium onto the film, and

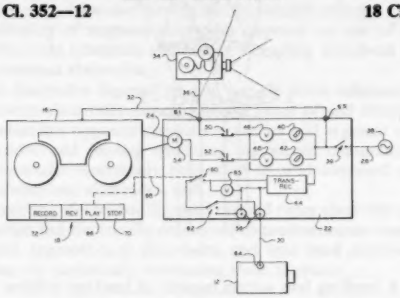
whereby when said switch is closed said synchronizing light bulb flashes on a frame of the film and said audio signal means emits an audio signal which is recorded by the sound recorder for use in thereafter synchronizing the visual action on the film with the audio on the sound recorder.

4,050,794

FILM-SOUND SYNCHRONIZATION SYSTEM

James R. Shields, Jr., R.D. 4, Canastota, N.Y. 13032

Continuation-in-part of Ser. No. 420,627, Nov. 30, 1973, abandoned. This application Feb. 13, 1975, Ser. No. 549,770
Int. Cl.[2] G03B *31/00*
U.S. Cl. 352—12 **18 Claims**



1. A system for synchronizing projection of a motion picture with playback of sound recorded on a medium separate from the film, said system comprising, in combination:

a. a moving picture projector;

b. a first line providing electrical power from a source to operate said projector;

c. a playback unit including an electric motor for driving the record medium past a stationary pickup means and an electrical sound system for producing audible sound from the movement of said medium past said pickup means;

d. a second line providing electrical power from a source to operate said sound system;

e. a third line connected between said motor and a source other than through said sound system for providing electrical power to operate said motor;

f. manually operable first switch means in said first line for interrupting power to said projector to allow said playback unit to operate at a faster rate than said projector for a selected time interval until synchronism between the motion picture and the sound is restored; and

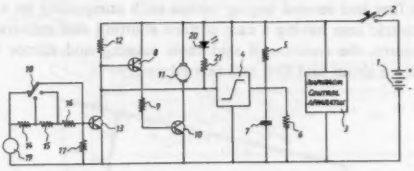
g. manually operable second switch means in said third line for interrupting power to said motor to allow said projector to operate at a faster rate than said playback unit, without interruption of the electrical power operating said sound system, for a selected time interval until synchronism between the motion picture and the sound is restored.

4,050,795

MOTION PICTURE CAMERA OPERABLE BY A SINGLE OPERATING SWITCH

Eduard Wagensonner, Aschheim; Theodor Huber, Munich, and Bernhard von Fischern, Ottobrunn, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 4, 1976, Ser. No. 663,814
Claims priority, application Germany, Mar. 8, 1975, 2510142
Int. Cl.² G03B 7/08
U.S. Cl. 352—141 11 Claims



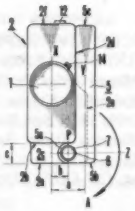
1. In a motion picture camera having film, a battery, film transport means for transporting said film, a diaphragm having an aperture, and electronically energized diaphragm control means for adjusting said aperture in accordance with light available for exposure, apparatus for automatically energizing said film transport means following the operation of said diaphragm control means in response to external activation of a single operating switch, comprising, in combination, connecting means for directly connecting said film transport means and said diaphragm control means to said battery upon external operation of said single operating switch; control switch means connected to said film transport means for blocking the energization of said film transport means until receipt of a control signal; and delay circuit means for furnishing said control signal to said control switch means only after completion of the operation of said diaphragm control means.

4,050,796

MOTION PICTURE CAMERA PRESENTING A FOLDABLE GRIP

Yoshio Komine, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1976, Ser. No. 658,163
Claims priority, application Japan, Feb. 20, 1975, 50-21334
Int. Cl.² G03B 17/00
U.S. Cl. 352—243 17 Claims



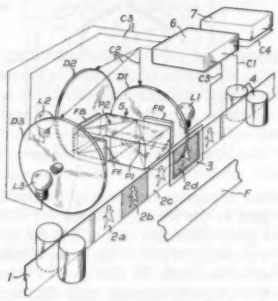
1. A motion picture camera comprising:
A. a camera body including a bottom wall and a side wall;
B. a grip adapted for holding a camera, said grip being constructed independently of said camera body;
C. link means for pivoting said grip rotatably on said camera body, said link means being provided with a mounting orifice, said grip being pivoted rotatably on said camera body by said link means between a first position protruding outwardly from said camera body generally outstanding from said bottom wall thereof and a second position where said grip is folded along said side wall of said camera body; and
D. actuating means adapted to actuate said camera, said actuating means being attached to said link means through said mounting orifice thereof to be slidable along said mounting orifice in response to manual operation for actuating said camera.

4,050,797

METHOD AND APPARATUS FOR OBTAINING IMAGES OF DIFFERENT COLOR INTENSITIES COMBINATIONS AND RELATIONSHIPS

Jean M. Weiss, 50, rue Sebastien Mercier, 75015 Paris, France

Filed Dec. 18, 1974, Ser. No. 534,065
Claims priority, application France, Dec. 27, 1973, 73.46640; Dec. 12, 1974, 74.37326
Int. Cl.² G03B 21/00
U.S. Cl. 353—30 4 Claims



1. A method of obtaining a plurality of resultant images reproducing the same pattern with different color intensities, combinations and relationships using at least two different information images each having the same pattern produced from the same master pattern image showing said pattern, said method comprising the steps of
a. producing at least first and second predetermined information images obtained from said master pattern image
b. recording said at least first and second information images on respective at least first and second single image storing elements;
c. successively and repetitively positioning said respective image storing elements at a predetermined position so that said first and second image storing elements are successively and repetitively positioned at said predetermined position;
d. cyclically performing the steps of snychronously and successively illuminating each of said image storing elements bearing said information images, when the respective storing elements are at said predetermined position, with flashed light of one color selected from at least two primary colors, and superimposing the successive effects resulting from the successive illuminations of the respective image storing elements in order to obtain a resultant image;
e. said step of positioning said at least first and second storing elements comprising positioning said image storing elements successively in said predetermined position at a rate selected such that the storing element at said position is changed at least six times per second for superimposing said successive effects when seen by the eye, and
f. varying, during the performance of said cyclically performed steps, at least one of the following parameters; the number of at least one information image, and the color of illumination of at least one information image.

4,050,798

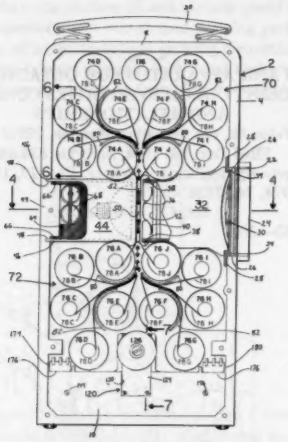
VISUALIZER

William O. Boggs, 1333 N. Robberson, Springfield, Mo. 65802

Filed Dec. 18, 1975, Ser. No. 642,019

Int. Cl.[2] G03B *21/26*

U.S. Cl. 353—35 **26 Claims**



1. A visualizer apparatus comprising: a housing; means defining a film gate in the housing; means for illuminating one side of the film gate; a plurality of spools in the housing beyond the film gate; a plurality of film strips in the housing and superimposed on each other with the film gate to form a composite illustration when properly aligned, each film strip being connected to a different spool so that when any spool is rotated in the proper direction the film strip connected to it will wind around the spool; a rotatable drive element associated with each spool in the housing and normally being disengaged from its spool so that it will rotate independently of its spool; an electric motor in the housing; means coupling the electric motor with the drive elements for all of the spools so that when the electric motor is energized all the drive elements will rotate; clutch means associated with each spool for coupling the spool with its respective drive element when the clutch means is actuated; and separate switch means associated with each clutch means for electrically connecting the motor with a source of electrical energy when the clutch means associated with the switch means is actuated, whereby when a specific clutch means is actuated, the electric motor will be energized, causing all the drive elements to rotate, and the spool associated with the actuated clutch means will rotate so that its film strip will wind around it.

4,050,799

MICROFORM READER

Roger A. Gross, Hartford; Marvin D. Radloff, Woodland, and Donald D. Gault, Neosho, all of Wis., assignors to Bell & Howell Company, Chicago, Ill.

Filed Mar. 31, 1975, Ser. No. 563,949

Int. Cl.[2] G03B *21/22*; G02B *7/02*; G03B *3/00*

U.S. Cl. 353—74 **9 Claims**

1. In a microform reader apparatus of the type which projects a magnified image of a film frame onto a viewing screen and which includes a light source, a condensing lens, a film holder and a projection assembly including a projecting lens and a plurality of mirrors for projecting the magnified image onto the viewing screen, the improvement of an adjustable mirror assembly for maximizing the light delivered to the projection lens to optimize the brightness of the displayed image comprising:

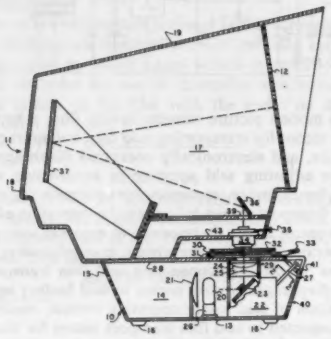
a mirror having a major reflecting surface positioned in between the light source and the condensing lens for receiving the light emitted by the light source on said major reflecting surface;

a universal mount for holding said mirror and for providing said mirror freedom of arcuate positional movement about first and second axes, said first and second axes being perpendicular to each other;

first urging means abutting said universal mount for adjusting the position of said mirror about said first axis;

second urging means abutting said universal mount for adjusting the position of said mirror about said second axis;

said first and second urging means each comprising an eccentric cam having a cam surface abutting said universal mount, the rotation of said cams causing said mirror to move about said first and second axes;



a pair of side walls, said universal mount including a first member extending across said side walls and pivotably mounted to said side walls;

a second member having first and second ends, said first end including a mirror holder for holding said mirror, said second member being pivotably mounted to said first member at an intermediate point between said first and second ends;

an end wall adjacent said second end of said second member; and;

resilient force means connecting said second end to said end wall to thereby maintain said cam surfaces in constant abutment relation to said universal mount.

4,050,800

DEVICE FOR SUCCESSIVE REPRODUCTION OF INFORMATION

Hiroshi Ogawa, and Masao Ariga, both of Kawasaki, Japan, assignors to Canan Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 19, 1976, Ser. No. 650,042

Claims priority, application Japan, Jan. 30, 1975, 50-12863; July 16, 1975, 50-87027

Int. Cl.[2] G03B *27/62*

U.S. Cl. 355—75 **8 Claims**

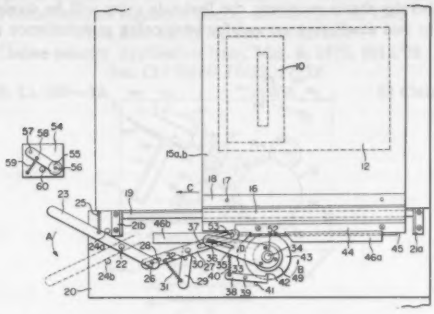
1. A device for forming successive reproductions, wherein said device includes a reciprocating original carrying table, and comprises in combination:

an information support table disposed for reciprocal movement for being positioned over said original carrying table to permit reproductions to be made of said information;

means for moving said movable table to change the said information to be reproduced by successively shifting said movable table over said original carrying table, wherein said moving means comprises a plurality of at least three interconnected links, one of said links being coupled to said original carrying table to transmit a driving force of said carrying table to move said movable table; and

means including another of said links engaged with said one

link for varying the distance of said shifting movement of the movable table, wherein said distance is varied by



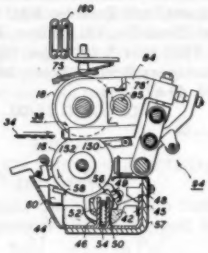
changing the point of engagement between said engaging links.

4,050,801

RELEASE AGENT APPLICATION SYSTEM FOR A HEATED FUSER ROLL

Alan F. McCarroll, Rochester, and Douglas P. Connolly, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 28, 1974, Ser. No. 473,846
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 R **8 Claims**



1. Roll fuser apparatus comprising:

a heated fuser roll structure;

a backup roll cooperating with said fuser roll structure for forming a nip through which copy sheets pass with toner images thereon contacting said heated fuser roll structure;

a sump containing liquid release agent to be applied to said fuser roll structure;

means for wicking said release agent to the surface of said fuser roll structure and simultaneously removing toner material therefrom;

means adapted to effect engagement of different portions of said wicking means with said fuser roll structure in order to permit periodically the engagement of a new wick portion with said fuser roll structure, said engagement effecting means comprising an elongated support member having a plurality of concave surfaces thereon, said support member being rotatably supported adjacent said fuser roll structure with different portions of said wicking means disposed therebetween in accordance with the positioning of said concave surfaces relative to said fuser roll structure; and

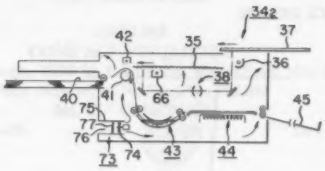
means for doctoring the release agent applied to said fuser roll structure to a substantially uniform thickness and to remove toner therefrom.

4,050,802

ELECTROPHOTOGRAPHIC COPYING MACHINE

Keiji Tanaka, Kawasaki; Yujiro Ando, Yokohama, and Katsunobu Ohara, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 471,916, May 21, 1974, Pat. No. 3,936,184.
This application Jan. 27, 1976, Ser. No. 652,871
Claims priority, application Japan, May 25, 1973, 48-58903; July 9, 1973, 48-77272; Nov. 9, 1973, 48-126039
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 R **14 Claims**



1. A dust protection method for an electrophotographic apparatus wherein an electrostatic latent image is formed with the utilization of at least illuminating means and means for applying voltage by corona discharge, which comprises:

directing, by blower means, air which has passed through dust removing means into a housing of said electrophotographic apparatus which accommodates means for forming an image; and

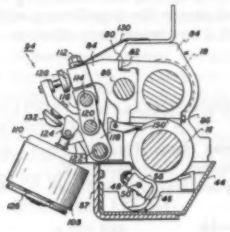
maintaining the air pressure inside the housing at a higher value than the pressure of the ambient air to cause an air flow from the inside of the housing to the outside of the housing, thereby filling the inside of the housing with dust-free air and preventing dusty air from entering into the housing, wherein the electrophotographic apparatus is protected from dust.

4,050,803

QUICK RELEASE MECHANISM FOR A BACKUP ROLL FUSER EMPLOYED IN A COPIER APPARATUS

Alan F. McCarroll, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 28, 1974, Ser. No. 473,845
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 R **13 Claims**



1. A roll fuser assembly for use in a copier apparatus for fixing toner images to sheets of copy paper, said assembly comprising:

a heated fuser roll structure;

means for supporting said fuser roll structure for rotational movement in said fuser assembly;

a backup roll;

means for securing said backup roll above said fuser roll structure whereby said roll and roll structure form a nip therebetween through which sheets of copy paper having toner images thereon pass with the toner images contacting said heated fuser roll structure; and

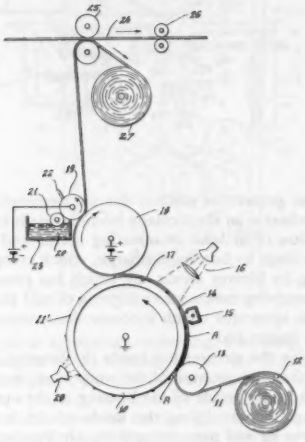
means for supporting said backup roll above said fuser roll structure with said securing means removed to thereby render it unnecessary to handle said backup roll prior to removal of said securing means.

4,050,804

LIQUID INK IMAGING SYSTEM

Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 4, 1976, Ser. No. 692,838
Int. Cl.² G03G *15/10*
U.S. Cl. 355—10 **4 Claims**



1. An electrostatic imaging apparatus comprising: a photoconductor assembly; means for positioning the inner surface of a dielectric web against said photoconductor whereby an air gap is formed between said photoconductor and said web; charging means for applying a charge to the outer surface of said web; means for exposing a light pattern through said web, whereby the air gap is ionized and forms a latent image on the inner surface of the web; means for guiding the latent image bearing web away from the photoconductor, including a conductive roller, said roller being biased at a potential sufficient to prevent charge transfer from said assembly to said web; a liquid developing system for developing the latent image on said web; and means for transferring said developed image from said web to an image copy member.

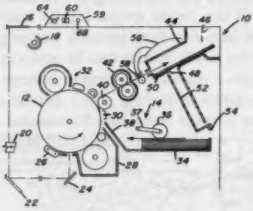
4,050,805

ELECTROPHOTOGRAPHIC COPYING APPARATUS FOR TWO-SIDED COPYING

Charles Thomas Hage, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 18, 1975, Ser. No. 633,149
Int. Cl.² G03G *15/00*
U.S. Cl. 355—14 **8 Claims**

1. In a document copier having processing stations for forming copies of documents on discrete sheets which are fed seriatim in a given travel path from a supply hopper through the processing stations to a receiving hopper, means for selectively operating the copier in a two-sided copy mode in which a first-side copy is formed on one side of a discrete sheet during a first-side copy cycle and a second-side copy is formed on the opposite side of the discrete sheet during a second-side copy cycle, comprising: an auxiliary tray selectively movable to a first position adjacent to said receiving hopper for receiving sheets therefrom and to a second position overlying said supply hopper, a deflector selectively movable to a first position intercepting said travel path into said receiving hopper to direct sheets toward said auxiliary tray and to a second position out of said travel path, and control means for positioning said deflector and said auxiliary tray in said first positions during the first-side copy cycle of said two-sided copy mode whereby sheets receiving the first-side copy will be directed into said auxiliary tray, and for positioning said deflector and



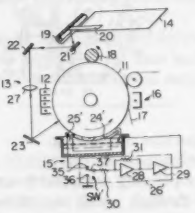
said auxiliary tray in said second positions during the second-side copy cycle of said two-sided copy mode whereby sheets may be fed from said auxiliary tray along said travel path to have the second side copy made thereon, the sheets thence being delivered to said receiver hopper.

4,050,806

METHOD AND APPARATUS FOR ELECTRICALLY BIASING DEVELOPING ELECTRODE OF ELECTROPHOTOGRAPHIC DEVICE

Seiichi Miyakawa, and Tadahiro Eda, both of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed May 7, 1975, Ser. No. 575,328
Claims priority, application Japan, May 10, 1974, 49-52010; June 14, 1974, 49-67714
Int. Cl.² G03G *15/00, 15/10*
U.S. Cl. 355—14 **22 Claims**



6. In an electrophotographic device having a photoconductive member, charging means for charging the photoconductive member, imaging means for radiating a light image of an original document onto the photoconductive member and a developing electrode disposed closely adjacent to the photoconductive member after the photoconductive member has been charged by the charging means and radiated with the light image by the imaging means, apparatus for electrically biasing the developing electrode comprising:

sensing means comprising a plurality of sensors for automatically sensing the potential remaining at a plurality of respective portions of the photoconductive member; and

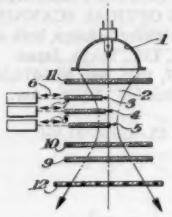
computing means comprising a comparator for automatically selecting the output of the sensor having the lowest value of the sensed potential, automatically computing the viasing voltage to be applied to the developing electrode in accordance with the lowest value of the sensed potential and applying said biasing voltage to the developing electrode.

4,050,807

PROCESS AND DEVICE FOR COPYING PHOTOGRAPHIC COLOR IMAGES

Siegfried Barbieri, Brixen, Italy, assignor to Durst AG. Fabrik Fototechnischer Apparate Bozen, Bolzano-Bozen, Italy

Filed Feb. 11, 1976, Ser. No. 657,075
Claims priority, application Italy, Mar. 6, 1975, 4812/75
Int. Cl.[2] G03B 27/32, 27/52
U.S. Cl. 355—32 12 Claims



1. A process for copying or enlarging of photographic images in accordance with the substractive method in which substractive color filters are selectively interposed at variable depths in the path of the printing light, the process being characterized by substantially removing wave lengths from the copying light in the overlapping wave length range of the spectral sensitivity curves of photographic copying paper whereby disruptions caused by the reciprocal effect of filters in the overlapping wave lenths is minimized.

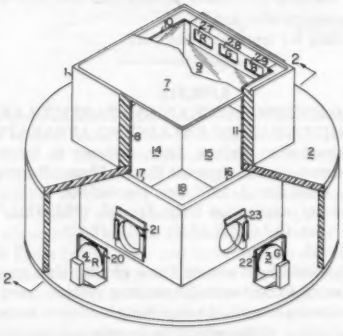
7. A device for filtering undesirable wave lengths from light used for copying photographic color images by the substractive method in which substractive color filter are selectively interposed at variable depths in the path of the printing light, comprising filter means, and the filter means being characterized by substantially filtering out wave lengths corresponding to the overlapping wave lengths of the spectral sensitivity curves of photographic copying paper.

4,050,808

ADDITIVE COLOR PRINTING METHOD AND APPARATUS

Robert Paul Gyori, Studio City, and Thomas Tullio, Burbank, both of Calif., assignors to De luxe General, Incorporated, Hollywood, Calif.

Filed July 9, 1976, Ser. No. 703,735
Int. Cl.[2] G03B 27/78, 27/32
U.S. Cl. 355—38 12 Claims



2. Light-emissive apparatus, comprising:

a. a hollow housing (1) having a translucent transparency-receiving surface (7) and plural light sources (3, 4, 5, 6) of different spectral characteristics spaced from said surface,

b. a specularly reflective surface (8, 9, 10, 11) within said housing adjacent to said translucent surface,

c. a non-specularly reflective surface (14, 15, 16, 17, 18) within said housing adjacent to said light sources,

d. plural light-responsive means (27, 28, 29) positioned adjacent to said translucent transparency-receiving surface, and

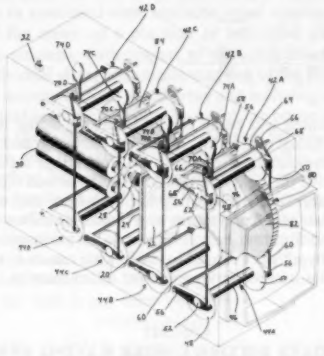
e. control means (33) connected to said plural light-responsive means and to said plural light source for the respective individual control of the output of said plural light sources of different spectral characteristics.

4,050,809

COMPACT VISUALIZER

William O. Boggs, 1333 N. Robberson, Springfield, Mo. 65802

Filed July 26, 1976, Ser. No. 708,888
Int. Cl.[2] G03B 21/26
U.S. Cl. 353—35 11 Claims



1. A visualizer for composing composite illustrations, said visualizer comprising; a case; means defining a gate within the case; a first spool located beyond one end of the gate; a second spool located beyond the other end of the gate; a film strip connected to and wound around the first and second spools, the film strip passing through the gate intermediate the first and second spools; a rotatable drive member in the case; and actuating means for moving one or the other of the spools into engagement with the periphery of the drive member to rotate the spools, thereby causing the film strip to pass through the gate, the actuating means moving the first and second spools in unison such that when the first spool is moved into engagement with the periphery of the drive member, the second spool is moved away from the periphery of the drive member and vice-versa, the actuating means including first and second swing arms which pivot relative to the case and carry the first and second spools respectively, tie rods connecting the first and second swing arms to enable them to pivot in unison, and an actuating element for moving the swing arms.

4,050,810

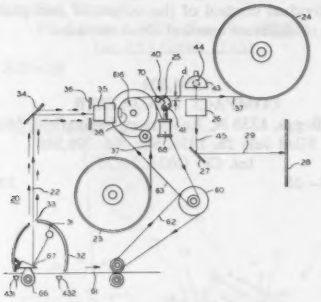
INSTANTANEOUS IMAGING MICROFILM RECORDING CAMERA WITH BLIP CONTROL

Milan A. Broderick, Riverwoods, and Eugene V. Mateja, Norridge, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Aug. 15, 1975, Ser. No. 605,122
Int. Cl.[2] G03B 27/32, 27/52, 27/70
U.S. Cl. 355—40 16 Claims

1. A microfilm camera comprising a supply of instant imaging film threaded through said camera and onto a take-up means, at least one instant developing station means disposed adjacent the path of said film, means for feeding successive documents into a copy station in said camera, means compris-

ing an image optical system for reflecting onto the film an image of a document fed into said camera as said film travels away from said supply and to said developing station, means responsive to the document feed for copying each image and for projecting a signal image onto the film at a point having a predetermined relationship to the image being copied when the signal is being projected, whereby an automatic searching device may count any selected number of said signals to find



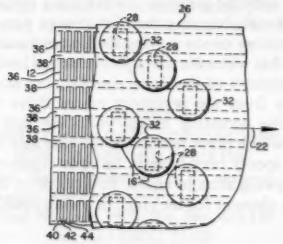
the image which was being copied when the signal was projected and fixing means for thereafter exposing said film to ambient ultraviolet light to release gas from image areas which did not receive the light of either said image or said signal, and means for thereafter transporting said film from said developing station past said fixing means to said take-up means without exposing said film to a heat sufficient to set an image on said film, whereby all gas released by said fixing means evaporates from said film without any permanent effect thereon.

4,050,811

OPTICAL DATA RECORD COPIER HAVING ARRAY OF LENSES WITH FIELD GAPS ALIGNED WITH DATA GAPS

James T. Russell, Richland, Wash., assignor to Eli S. Jacobs, New York, N.Y.

Filed Apr. 21, 1976, Ser. No. 679,005
Int. Cl.[2] G03B *27/44, 27/50, 33/10;* G01D *9/42*
U.S. Cl. 355—46 **14 Claims**



1. Copying apparatus for making photocopies of optical data records, comprising:

first means for supporting a master record in a copying position, said master record having optical data tracks recorded thereon which include a plurality of spaced data groups separated by data gaps on said master record;

light means for directing light at said master record to produce light images of said data groups;

second means for supporting a photocopy record adjacent to said master record in said copying position;

a plurality of lenses supported between said master record and said photocopy record in an array of lenses extending across the master record, said lenses being positioned in spaced relationship so that the light images of different data groups are each transmitted through a different lens of said array to said photocopy record; and

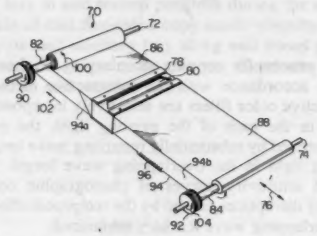
field separation means for limiting the viewing fields of said lenses simultaneously and for causing the fields of view of the array lenses when viewing the master record to be separate and spaced apart by field gaps at said master record which are aligned with said data gaps.

4,050,812

LIGHT SHIELD CURTAIN ASSEMBLY FOR RECIPROCATING OPTICAL SCANNING HEAD

Yutaka Koizumi, and Yoshiharu Iwanaga, both of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Apr. 7, 1976, Ser. No. 674,351
Claims priority, application Japan, Apr. 15, 1975, 50-50843[U]
Int. Cl.[2] G03G *15/04*
U.S. Cl. 355—66 **6 Claims**



1. A curtain assembly for a reciprocating optical scanning head, comprising;

first and second rollers extending perpendicular to a direction of reciprocation of the scanning head and disposed on opposite sides of the scanning head in said direction respectively;

a first curtain fixed at opposite ends to the first roller and the scanning head respectively, the first curtain being rolled around the first roller;

a second curtain fixed at opposite ends to the second roller and the scanning head respectively, the second curtain being rolled around the second roller;

first and second pulleys fixed for rotation with the first and second rollers respectively;

a wire fixed at opposite ends to the first and second pulleys and being rolled around the first and second pulleys in directions opposite to directions in which the first and second curtains are rolled around the first and second rollers respectively; and

biasing means for tensioning the wire.

4,050,813

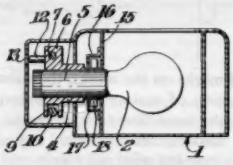
LAMP-ADJUSTING MECHANISM, PARTICULARLY FOR PHOTOGRAPHIC ENLARGING APPARATUS

Wilmuth Pramstraller, Brixen, Italy, assignor to Durst AG. Fabrik Fototechnischer Apparate Bozen, Bizano-Bozen, Italy

Filed Jan. 2, 1975, Ser. No. 645,939
Claims priority, application Italy, Jan. 10, 1975, 6701/75
Int. Cl.[2] G03B *27/54;* F21V *19/02*
U.S. Cl. 355—67 **7 Claims**

1. An adjustable light source for a photograhic projector apparatus having a condenser illuminating system, comprising a condenser having an optical axis, a lamp having a characteristic profile, a holder within which the lamp is mounted, a housing, a longitudinal separating wall disposed within the housing whereby the housing is separated into longitudinal traversing mechanism and lamp-containing compartments, longitudinal traversing means being mounted in the longitudinal traversing compartment, the longitudinal traversing means comprising

substantially parallel lead screw and guide rod mounted longitudinally parallel to each other in the longitudinal traversing compartment, a nut is connected to the holder and operatively engaged with the lead screw for longitudinally traversing the holder and light source towards and away from the condenser when the lead screw is rotated, a tilting control rotatably mounted on the housing, eccentric connecting means coupling the guide rod to the tilting control whereby rotation of the tilting control imparts an arcuate movement to the guide rod relative to the lead screw whereby the holder is adjustably



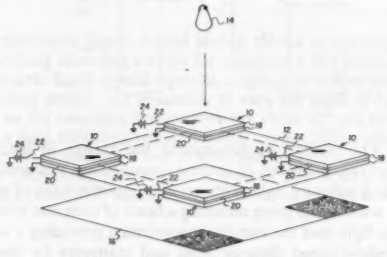
angularly tilted relative to the lead screw, a slot in the separating wall, the lamp holder being disposed through the slot with one end thereof connected to the lead screw and guide rod and the other end thereof being disposed in communication with the lamp-containing compartment, resilient light sealing means mounted on the separating wall alongside the slot whereby light from the lamp is prevented from passing through the slot into the longitudinal traversing compartment and whereby the tilting movement of the holder is accommodated to permit the position of the lamp relative to the condenser to be precisely adjusted.

4,050,814

PROGRAMMABLE LIGHT CONTROL MATRIX DEVICE

Thomas A. McFadden, Mountain View, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 24, 1974, Ser. No. 536,136
Int. Cl.² G03B *27/72*
U.S. Cl. 355—71 **12 Claims**



1. A programmable light control matrix device comprising a planar surface matrix array of cells, each cell being formed with a pair of transparent parallel electrodes separated by a film of electrooptic material having two states, one for passing and the other for blocking light, one state occurring when said cell is electrically energized and the other when it is deenergized wherein said array is formed with a pair of transparent parallel plates having inner and outer surfaces and said material is a continuous sheet disposed therebetween, one of said plates bearing on its inner surface adjacent said sheet a continuous conductive sheet constituting a common electrode of each of said cells and the other plate bearing on its inner surface adjacent said film a plurality of individual electrodes, each constituting the other electrode of said cells and being associated with an individual one thereof, whereby a cell is energized by applying an electric potential across its associated individual electrode and said conductive sheet, and said other plate has individual apertures passing between its inner and outer surfaces, there being one for each of said individual electrodes collinear with its associated electrode, having thin metallized walls which do not obstruct the passage of light so that it may pass therethrough from one of said plates to the other and that function as leads which connect to said individual electrodes for applying an electric potential thereto.

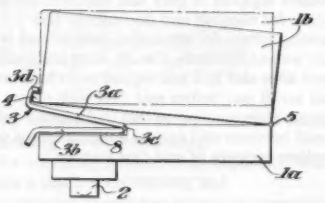
11. A programmable light control matrix device comprising a planar surface matrix array of cells, each cell being formed with a pair of transparent parallel electrodes separated by a film of electrooptic material having two states, one for passing light when deenergized and the other for blocking light when energized, wherein said array has adjoining rows and columns of cells and is formed with four planar surface subarrays in adjoining planar juxtaposition which are simultaneously energizable, each of said subarrays being formed with a pair of transparent parallel plates having inner and outer surfaces and said material is a continuous sheet disposed therebetween, with one of the plates of each subarray bearing on its inner surface adjacent its associated sheet alternate rows, with respect to the rows of the array, of a plurality of individual electrodes in alternate columns, with respect to the columns of the array, each individual electrode constituting one of the electrodes for the cells associated with its subarray and including conductive leads to said individual electrodes which are borne on the inner surface of the associated plate in the spaces between said alternate rows and the other plate of each subarray bears on its inner surface adjacent its associated film conductive strips coincident with said alternate rows constituting the other electrodes of each of the associated cells, so that a cell is energized by applying an electric potential across the conductive strip and the individual electrode corresponding thereto, said array being arranged so that none of the cells in one subarray overlap the cells in any other subarray.

4,050,815

PHOTOGRAPHIC ENLARGING APPARATUS WITH HINGED IMAGE HOLDER

Wilmuth Pramstraller, Brixen near Bozen, Italy, assignor to Durst S.p.A. Fabbrica Macchine ed Apparecchi Fototechnici, Balzano-Bozen, Italy

Filed Nov. 11, 1976, Ser. No. 740,975
Claims priority, application Italy, Nov. 13, 1975, 6721/75
Int. Cl.² G03B *27/62, 27/52*
U.S. Cl. 355—75 **6 Claims**



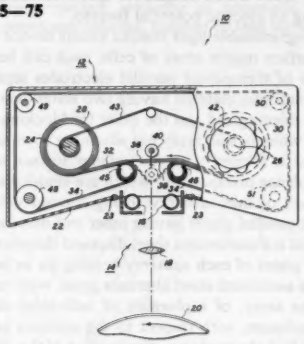
1. An image holding arrangement for a photographic enlarger having a lamp housing and a lens compartment separate from each other, movable means connecting the lamp housing to the lens holding compartment for movement of the lamp housing away from and towards the lens holding compartment, a hinged image holder disposed between adjacent portions of the lamp housing and lens holding compartment, the image holder having substantially flat upper and lower portions hinged to each other, and loose coupling means connecting the upper portion of the image holder to the lamp housing whereby movement of the lamp housing away from the lens holder automatically opens the image holder for insertion and removal of image material.

4,050,816

DOCUMENT HANDLING SYSTEM

Denis J. Stemmle, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 30, 1976, Ser. No. 701,371
Int. Cl.² G03B *27/62*; B65H *5/02, 5/04*
U.S. Cl. 355—75 **10 Claims**



1. In an automatic document handling system of a copying apparatus for making pre-collated copy sheet sets by repeated collated imaging of a set of original document sheets, the improvement comprising:

an elongated windable document holding first web;

means for forming a spaced pair of wound scrolls of said first web for winding up a set of otherwise unattached documents on said first web therein and retaining said documents between turns of said first web on both said web scrolls;

said first web having a minor intermediate unwound segment extending between said web scrolls for transporting exposed documents between said web scrolls and onto which documents are insertable and removable;

means for recirculatingly winding and unwinding said first web between one said web scroll and the other said web scroll to recirculating expose individual documents on said intermediate segment of said first web between said web scrolls in a pre-collated order;

a second web commonly wound with said first web on at least one of said scrolls for retaining documents thereon wound between said first and second webs;

optical imaging means for imaging documents on said intermediate segment of only said first web between said web scrolls for copying said documents; and

separating means for separating said second web from said first web and guiding it away from said intermediate segment after said first and second webs have unwound from said scroll and before said first web passes through said intermediate segment so that said second web is not interposed between said optical imaging means and said intermediate segment of said first web.

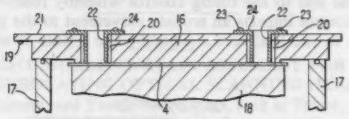
4,050,817

MANUFACTURE OF MULTI-LAYER STRUCTURES

Ian Derek Bromfield, Leicester, and Peter Seddon, Wigan, both of England, assignors to Nippon Kogaku K.K., Tokyo, Japan

Division of Ser. No. 466,914, May 3, 1974, Pat. No. 4,007,988.
This application Aug. 28, 1975, Ser. No. 608,683
Claims priority, application United Kingdom, May 3, 1973, 21073/73
Int. Cl.² G03B *27/00*
U.S. Cl. 355—133 **2 Claims**

1. In the manufacture of a multi-layer structure, a method of aligning a succession of masks relative to a photo-sensitive substrate, comprising: subjecting the substrate to a series of photographic exposures of selected areas of the substrate through a succession of masks, each mask being brought into a desired spatial relationship to the substrate, wherein each successive mask is correctly positioned relative to the substrate using fiducial marks on each successive mask which are each brought successively into a predetermined relationship with corresponding fiducial marks on the substrate without the superimposition on the latter of any photographic images of



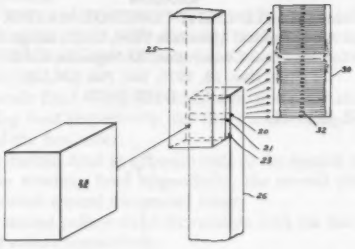
the fiducial marks on the masks, the substrate being subjected to a succession of main exposures through a succession of masks, and the same two fiducial marks on the substrate and respective uniform background regions surrounding said masks being exposed separately from said main exposure of the remainder of the substrate.

4,050,818

METHOD FOR DETERMINING CHANGES IN SPACING BETWEEN TWO POSITIONS OF INTEREST

William N. Sharpe, Jr., East Lansing, Mich., and Glenn W. Hollenberg, Kennewick, Wash., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 612,070, Sept. 10, 1975, Pat. No. 4,014,613.
This application May 21, 1976, Ser. No. 713,481
Int. Cl.² G01B *11/16*
U.S. Cl. 356—32 **1 Claim**



1. The method of determining the change in spacing between two positions of interest; comprising: positioning two linear ½ mil wire light scatterers on opposite sides of an adhesive within a lap joint; directing a beam of coherent monochromatic light past the two linear scatterers; providing a screen at a predetermined distance from said scatterers for displaying the interference pattern; providing markings on said screen for measuring the changes in the interference pattern.

4,050,819

UNDERSEA RANGING-COMMUNICATIONS FROM ALTITUDE VIA LASER

Samuel W. Lichtman, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 2, 1976, Ser. No. 702,267
Int. Cl.² H04B *9/00*; G01C *3/08*
U.S. Cl. 356—51 **10 Claims**

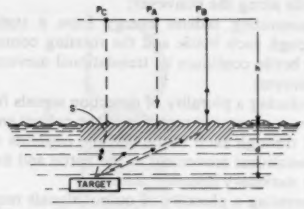
1. A system for detecting an object in water comprising:

a. a first source of light energy waves being propagated on to the water surface for sensitizing an area of the water surface;

b. a second source of light energy waves collimated with

said first source being propagated to the sensitized area of the water and being reflected by said water surface;

c. a third source of light energy waves collimated with said first and second light sources being propagated to the



sensitized area for penetrating the water and upon reflection from a submerged body modulates said second light source that is reflected from the water surface;

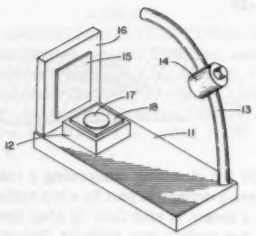
d. detector means for receiving the reflected modulated light source for detecting the presence of the submerged body.

4,050,820

LIGHT-REFLECTING ANALYTICAL DEVICE

John Franklin Hanny, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Feb. 17, 1976, Ser. No. 658,562
Int. Cl.[2] G01N *21/00*
U.S. Cl. 356—103 **10 Claims**



1. A cholesteric liquid crystal testing device comprising a light absorbing mounting surface for receiving a film comprising cholesteric liquid crystal material, a light source directed to the mounting surface and adjustable to vary the angle of light incident on the mounting surface between about 20° and about 70°, and a light reflecting surface located substantially perpendicular to the mounting surface to intercept light directed from the light source and scattered in a spectral hue from a film comprising cholesteric liquid crystals located on said mounting surface.

4,050,821

LINEWIDTH MEASUREMENT METHOD AND APPARATUS

John David Cuthbert, Bethlehem, and David Farnham Munro, Alburtis, both of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

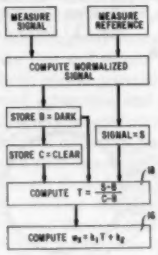
Filed Sept. 27, 1976, Ser. No. 726,603
Int. Cl.[2] G01B *11/02, 11/28;* G01N *21/22*
U.S. Cl. 356—156 **6 Claims**

4. Apparatus for measuring linewidths in selected subregions of a microminiature element, each subregion including features exhibiting two contrasting optical properties, said element also including at least two reference subregions each exhibiting uniformly a different one of said two optical properties, said apparatus comprising

means including a source for directing light at each of said reference subregions and at a selected subregion to be measured,

means responsive to light obtained directly from said source and from light that impinged upon said reference and selected subregions for generating normalized reference and subregions signals,

means for processing said normalized signals to generate a signal representative of one of said optical properties of said selected subregion,



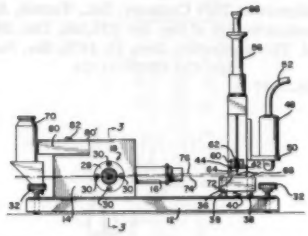
and means for processing said last-mentioned signal in accordance with a predetermined relationship to generate a signal directly representative of a specified linewidth in said selected subregion.

4,050,822

DROP MEASURING APPARATUS, AND A METHOD OF EVALUATING MATERIALS WETTABILITY

Felix R. Grat, Lake Hiawatha, N.J., assignor to Rame-Hart, Inc., Mountain Lakes, N.J.

Filed Mar. 10, 1976, Ser. No. 665,792
Int. Cl.[2] G01N *13/02*
U.S. Cl. 356—171 **17 Claims**



1. Liquid-drop measuring apparatus, for use as a materials-wettability evaluating device, comprising:

first means for accepting a liquid-drop deposition and supporting such a liquid drop thereon; and

second means coupled to said first means for measuring the height of a liquid drop which has been deposited and is supported on said first means; wherein

said first means comprises a platform having a planar surface on which to support a liquid drop, in order that said surface and the chord of a drop supported thereon will define a contacting interface therebetween:

said second means comprises means for gauging the elevation of an uppermost surface of such a drop from said surface of said first means; and

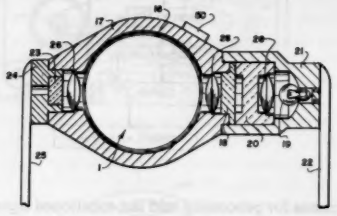
said gauging means comprises viewing means for visually fixing on a drop supported on said surface of said platform, and means for moving said viewing means in order visually to fix on the chord of such drop and to scan to the uppermost surface of such drop.

4,050,823

APPARATUS FOR CONTINUOUSLY MEASURING THE CO_2 CONTENT IN BREATHING GASES

Horst Frankenberger, Bad Schwartau, Germany, assignor to Dragerwerk Aktiengesellschaft, Lubeck, Germany

Division of Ser. No. 609,564, Sept. 2, 1975, Pat. No. 4,011,859.
This application July 22, 1976, Ser. No. 707,503
Claims priority, application Germany, Sept. 5, 1974, 2442589
Int. Cl.[2] G01J *3/50*
U.S. Cl. 356—186 3 Claims



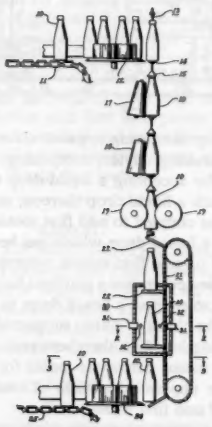
1. A gas measuring device comprising an annular mounting device having an opening therethrough, a respiratory gas tube extending through the opening and being held in said mounting device, a luminous source in said mounting device arranged on one side of said tube, an interference filter mounted on said mounting device and arranged in the path of rays from said luminous source and in the path of said tube, lens means on said mounting device for directing the rays through the tube and the gases therein, and a photodetector mounted on said mounting device on the other side of said tube from said luminous source.

4,050,824

METHOD AND APPARATUS FOR INSPECTING BOTTLED GOODS

Arthur F. Woodrow, and Jorge E. Simmons, both of Tucson, Ariz., assignors to TSN Company, Inc., Tucson, Ariz.

Continuation-in-part of Ser. No. 534,168, Dec. 19, 1974, abandoned. This application June 25, 1976, Ser. No. 700,013
Int. Cl.[2] G01N *21/24*
U.S. Cl. 356—197 13 Claims



1. A method for inspecting the contents of filled bottled goods and detecting the presence of foreign matter therein without affecting the translational speed of the bottled goods along a conveyer, said method comprising the steps of:

a. translating a plurality of filled bottles along a conveyer;
b. rotating each translating bottle and the contents thereof;
c. stopping the rotation of each bottle abruptly enough to inspire relative rotation between the contents and the bottle while continuing the translational movement of the bottle along the conveyer;
d. transmitting radiant energy from a stationary source through each bottle and the rotating contents thereof as the bottle continues its translational movement along the conveyer;
e. producing a plurality of detection signals from stationary detector means in response to the radiant energy transmitted through each bottle and the contents thereof during translational movement of the bottle and its contents past the stationary detector means;
f. generating a plurality of output signals responsive to the plurality of detection signals and indicative of the transmitted radiant energy intercepted by the bottle and the contents thereof;
g. comparing the plurality of output signals with one another to provide a compared signal reflective of the coincidence of the detection signals; and
h. determining the presence of foreign matter in each bottle from the compared signal.

4,050,825

CAKE OF SOAP, ESPECIALLY FOR WASHING HANDS

Walter Stein, 18 Hauptstrasse, D-7707 Engen, Germany

Filed Dec. 3, 1973, Ser. No. 420,972
Int. Cl.[2] A46B *15/00*; C11D *17/04*
U.S. Cl. 401—19 13 Claims

1. An article for cleansing comprising a cake of soap, said cake of soap being defined in part by a top surface and opposite end surfaces, a recess in said cake of soap opening upwardly through said top surface and endwise through said end surfaces, said opening being defined by a bottom surface and opposing spaced inner peripheral surfaces between said top and bottom surfaces and extending between said end surfaces, an imperforate plate in said recess completely covering said bottom surface, means securing said plate to said cake of soap, bristle means carried by said plate and being at least partially disposed within said opening, said plate having means for preventing water from erroding said peripheral surfaces thereby precluding disintegration of said cake of soap, and said errosion preventing means being defined by an upper surface of said plate opening concavely outwardly in a direction toward said top surface.

4,050,826

LIQUID APPLICATOR

Walter G. Berghahn, Scotch Plains, and Jack Weinstein, Old Bridge, both of N.J., assignors to Bristol-Myers Company, New York, N.Y.

Filed Feb. 11, 1976, Ser. No. 657,345
Int. Cl.[2] B05C *21/00*; B43K *5/00, 8/02*
U.S. Cl. 401—196 6 Claims

1. A liquid applicator suitable for use in the application of liquids to a surface of the human body comprising a container having a container body adapted for storing a quantity of said liquid, said container having an opening at one end thereof which is provided with an upper margin, step means spaced below said upper margin of said opening and extending inwardly from the walls of said opening, said step means being adapted to support a shaped applicator means; shaped applicator means positioned in said opening and resting on said step

means; said applicator means being releasibly secured in said opening of said container; said shaped applicator means comprising a non-flexible, non-deformable, sintered, porous synthetic plastic resin structure having a controlled porosity and having omni-directional interconnecting pores, said applicator

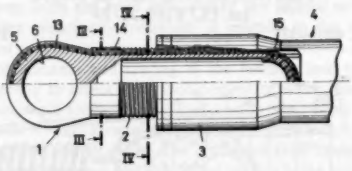
also including a collecting channel disposed adjacent said shaped applicator means adapted to collect overflow liquid coming through the pores of said shaped applicator and directing it back into said container, passage of the fluid collecting in said collecting channel and draining back into said container being possible only through the pores of said applicator.

4,050,827

FORCE TRANSMITTING STRUCTURAL MEMBER

Wolfgang Jonda, Oberpframmern, Germany, assignor to Messerschmitt-Bolkow-Blohm G.m.b.H., Munich, Germany

Filed Sept. 10, 1975, Ser. No. 612,102
Claims priority, application Germany, Sept. 14, 1974, 2444084
Int. Cl.² B25G *3/00*; A44B *21/00*
U.S. Cl. 403—11 **11 Claims**



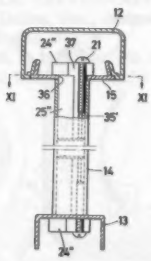
1. A structural member capable of transmitting both tensile and compressive stresses and of transmitting a predetermined load, comprising an elongated part, said part comprising at least one end section and a separate intermediate section with said at least one end section and intermediate section coupled together as a unit, said at least one end section projecting outwardly from said intermediate section and each capable of transmitting the predetermined load of the structural member, wherein the improvement comprises that said at least one end section includes a first subsection and a second subsection spaced apart in the elongated direction of said elongated part and integrally joined together, said first subsection forming the end of said end section spaced from said intermediate section and having attaching structure adjacent the end of said end sections spaced from said intermediate section, said second subsection having a connecting structure on the exterior thereof for connecting said end section to said intermediate section, the attaching structure in said first subsection arranged for attaching said end section to a different member for transmitting the predetermined load between said elongated part and the different member, said second subsection having grooves formed in the exterior surface on opposite sides thereof with the grooves extending in the elongated direction of said part, the grooves penetrating inwardly from the exterior surface through the connecting structure in the exterior surface of said second subsection so that the base of the grooves are spaced inwardly from the connecting structure, said end section being capable of transmitting the predetermined load in the elongated direction of said elongated part between said first and second subsections, said end section including a fiber-reinforced synthetic plastic material wound in a continuous manner in the elongated direction of said elongated part around both the first and second subsections with the fiber-reinforced synthetic plastic material being located in the grooves in said second subsection and extending transversely of the attaching structure in said first subsection of said at least one end section, and the integrally joined said first and second subsections and said fiber-reinforced synthetic plastic material each having a different E-modulus and said integrally joined first and second subsections and said fiber-reinforced synthetic plastic material wound thereon each being capable of transmitting the predetermined load so that if a failure of said integrally joined first and second subsections occurs said plastic material can transmit the predetermined load.

4,050,828

METHOD OF INTERLOCKING A LATERAL MEMBER AND THE END OF A HOLLOW POST AND THE JOINT CONSTRUCTION USED THEREIN

Tadaomi Noro, 19-3 Tsurukawa 4 chome, Machida, Tokyo, Japan

Division of Ser. No. 559,812, March 19, 1975, Pat. No. 3,962,774. This application May 3, 1976, Ser. No. 682,472
Int. Cl.² E04H *17/14, 17/16*
U.S. Cl. 403—201 **7 Claims**



1. A construction for jointing a lateral member and one end of a hollow post, which comprises

a. a stud composed of a stud body adapted to fit substantially snugly against the inner wall of the hollow post and a stud head for holding the lateral member in a desired position,

1. the inner wall of the hollow post having at least one self-tapping screw guide groove formed by a pair of parallel protrusions in the hollow post, the pair of parallel protrusions fitting in a longitudinal groove in the stud body, and

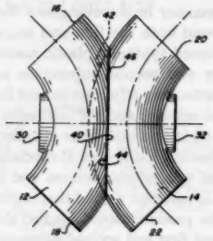
b. at least one self-tapping screw to be driven into a gap between the inner wall of the hollow post and the stud body along the axial direction of the hollow post, the screw threads of the self-tapping screw biting into the stud body and the inner wall of the hollow post for rigid connection of the stud body and the inner wall of the hollow post.

4,050,829

DOUBLE-SIGMOID CONNECTOR

Ronald Paul Glanz, New Albany, Ind., assignor to Chemetron Corporation, Chicago, Ill.

Filed Apr. 22, 1976, Ser. No. 679,338
Int. Cl.[2] F16B 1/00
U.S. Cl. 403—205 3 Claims



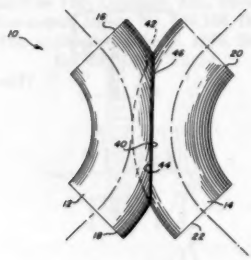
1. A double sigmoid connector comprising: a pair of arcuate pipe elbows having coplanar, arcuate centerlines, one of said pair having an elongated opening in its outer periphery and the other of said pair having a portion of its outer periphery extending into said opening and substantially closing same, said one elbow being rigidly joined to said other elbow around said opening, wherein the improvement comprises: each of said pair of elbows having an outlet formed in its inner periphery and extending inwardly of said inner periphery.

4,050,830

DOUBLE-SIGMOID CONNECTOR

Robert Charles Paulin, Clarksville, Ind., and Ronald Joseph Billings, Fern Creek, Ky., assignors to Chemetron Corporation, Chicago, Ill.

Filed Apr. 22, 1976, Ser. No. 679,335
Int. Cl.[2] F16B 1/00
U.S. Cl. 403—205 6 Claims



1. A double sigmoid structural connector comprising: a pair of arcuate pipe elbows having coplanar, arcuate centerlines, one of said pair having an elongated opening in its outer periphery and the other of said pair having a portion of its outer periphery extending into said opening and substantially closing same, said one elbow being rigidly joined to said other elbow around said opening.

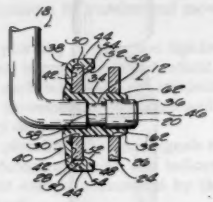
4,050,831

UNITARY BUSHING AND RETAINER ASSEMBLY

Edmund H. DuBois, Zion, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Sept. 15, 1976, Ser. No. 723,487
Int. Cl.[2] B25G 3/00; F16B 9/00, 13/06
U.S. Cl. 403—243 7 Claims

1. A unitary bushing and retainer assembly comprising a first work piece including a shank portion which has a recess, a second work piece including a main body and an ear which is integrally connected to said main body in generally spaced parallel relation to said main body, said main body and ear having therein respective coaxial apertures, and a unitary bushing and retainer comprising a sleeve portion extending through both of said second work piece apertures and including a bore extending coaxially with said apertures and pivotally



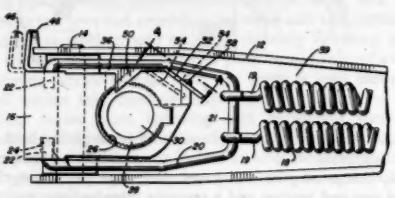
receiving said shank portion of said first work piece, retainer means located between said apertures of said second work piece, on said sleeve portion bore and engaging said recess in said shank portion of said first work piece, thereby positively resisting withdrawal of said shank portion from said bore, and means for preventing movement of said second work piece axially of said shank portion of said unitary bushing and retainer.

4,050,832

WINDSHIELD WIPER PIVOT ARM CONNECTION

Donald W. Stratton, St. John, Ind., and John P. Moorhead, Palos Verdes, Calif., assignors to The Anderson Company, Gary, Ind.

Filed Nov. 10, 1976, Ser. No. 740,398
Int. Cl.[2] F16B 21/10
U.S. Cl. 403—321 15 Claims

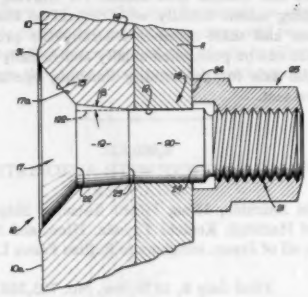


1. A wiper arm assembly comprising a mounting head having a socket and an arm pivotally connected to the mounting head and projecting longitudinally outwardly from the mounting head, spring means connected between said mounting head and said arm for pivoting said arm relative to said mounting head, and a latch slidably mounted on said mounting head, said latch comprising a body portion mounted on said mounting head for sliding movement in a direction parallel to the longitudinal axis of said arm, blocking means carried by said body portion, retaining means carried by said body portion and spaced from said blocking means, and actuator means carried by said body portion, said latch in one position will engage the blocking means with said arm to block said arm relative to said mounting head and will clear the retaining means from interference with the socket, and said latch means in a second position will clear the blocking means from interference with said arm and will overlap said retaining means over said socket.

4,050,833
TAPER HEADED FASTENER TO INCREASE WORK FATIGUE LIFE

Franklin S. Briles, 1301 Dolphin, Corona del Mar, Calif. 92625

Filed July 30, 1975, Ser. No. 600,388
Int. Cl.[2] F16B 5/02
U.S. Cl. 403—405 7 Claims



1. In a fastening assembly capable of displacing work material between first and second locations, the first location being proximate the junction between a workbore and a conical countersink surface in the work, the second location being at the work surface adjacent and closely bounding the countersink surface, the combination that comprises:

a. a fastener head and shank, the head being conical to closely interfit the work countersink surface, the conical head defining an included conical angle of at least about 100°,

b. the shank defining first, second and third sections in a lengthwise axially forward sequence away from the head, the third section being threaded to receive a tightening nut, the second section being cylndrical and having an outer diameter to closely fit the workbore diameter,

c. the first shank section being conically tapered forwardly away from the head and toward the second section and being sufficiently oversized in relation to the workbore that interference force will develop in response to forward displacement and seating of the fastener into the work, thereby to effect said displacement of work material between said locations, said first section taper being less than about 4° and greater than about ½°, the work to include first and second panels, the combined axial extents of said conical head and said shank first section being less than the thickness of said first panel, whereby said first section will be located entirely within the first panel,

d. the work to have a rear side face into which said countersink is sunk, whereby when said fastener is seated in said work said work rear side face will form a rearward bulge extending annularly about the rearward facing side of the head at said second location, the entirety of the bulge being immediately proximate to the radially outermost periphery of the head.

4,050,834
INTERNALLY POWERED TRAFFIC CONTROL DEVICE

John H. Lee, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 4, 1976, Ser. No. 655,091
Int. Cl.[2] E01F 11/00, 9/08
U.S. Cl. 404—16 14 Claims

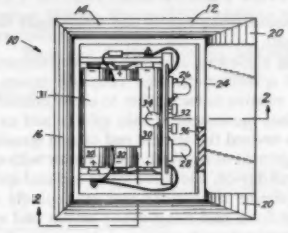
10. A traffic lane delineator device comprising

a housing adapted to be secured to a roadway surface and subjected to vehicle traffic thereon comprising a base, a rigid top and sloped sides supporting the top facilitating the passage of vehicles thereover without damage to the housing, wherein one of said sides is adapted to allow light to pass therethrough,

a light emitting diode positioned within the housing such that light produced thereby emerges through said one side,

a power supply including a rechargeable battery pack and a solar cell for recharging the battery pack during periods of high ambient light intensity positioned with the housing,

a network positioned within said housing for controlling the energization of the light emitting diode, including oscillator means which when activated periodically energizes the light emitting diode and light sensing means for activating the oscillator means when the intensity of the ambient light is below a predetermined level, and



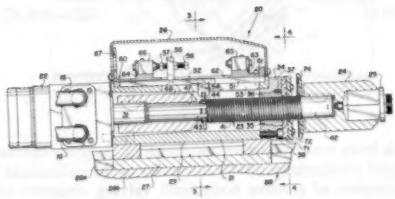
a retroreflective material disposed adjacent said one side for enhancing the visibility of the delineator device during periods when the network is de-energized,

whereby the use of the periodically energized light emitting diode enables the delineator device to be small, compact and rugged, usable directly on traffic surfaces while yet having appreciable intensity and practical battery life enabling acceptable maintenance intervals.

4,050,835
HYDRAULIC TAPPING APPARATUS

Robert C. Womack, Dallas, Tex., assignor to AAA Products International Inc., Dallas, Tex.

Filed Feb. 2, 1976, Ser. No. 654,179
Int. Cl.[2] B23G 1/00; B23B 47/00
U.S. Cl. 408—11 10 Claims



1. Hydraulic tapping apparatus comprising

an elongated housing, including an elongated body having a motor end and a spindle end; said housing body having external means for indexing said housing relative to a supporting fixture; and a reversible hydraulic motor mounted at said body motor end, with its drive shaft extending axially into said body; a lead nut nonrotatably mounted at said body spindle end;

a spindle having a lead screw intermediate its ends for coaction with said lead nut, having means for mounting a tap at its outer end, and having spline means at its inner end; said motor shaft including drive spline means for coupling with said spindle spline means;

said lead nut and said motor shaft supporting said spindle for

rotation and for longitudinal movement relative to said housing;

said housing having means defining an elongated guideway extending parallel to the rotational axis of said spindle;

a control carriage supported in said guideway for rectilinear movement therealong; means coupling said control carriage to said spindle for simultaneous longitudinal movement;

a reversing control device and stop control device mounted in longitudinally spaced relation on said housing; and adjustable actuators mounted on said control carriage for engaging and actuating said reversing and stop control devices;

said drive spline being axially and rotationally fixed to said motor shaft;

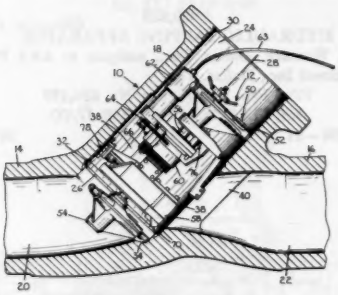
said housing guideway, said lead nut, said control carriage, and said spindle-to-carriage coupling means, all being disposed relative to each other to allow limited additional longitudinal movement of said spindle and carriage in a direction toward the spindle end of said housing, following engagement of an adjustable actuator with said reversing control device; said drive spline and said spindle spline having relative dimensions that said spindle spline will disengage from said drive spline before said spindle and carriage exceed said additional longitudinal movement toward the housing spindle end, thereby preventing damage to said apparatus in the event of failure of said reversing control device.

4,050,836

PORTABLE FIELD MACHINE FOR CUTTING, GRINDING AND LAPPING VALVE SEATS

Ronald J. Anders, Raleigh, N.C., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed July 1, 1976, Ser. No. 701,958
Int. Cl.² B23B *3/26, 41/00*
U.S. Cl. 408—20 **13 Claims**



1. A body mounted valve seat finishing machine operatively disposed substantially totally internally of the cylindrical valving chamber of a valve body, said valving chamber having axially spaced surfaces coaxially disposed with respect to a control axis, said surfaces being on opposite sides of an annular valve seat having a profile adapted for sealing engagement by a valving member which is translatable along the control axis between a valve closed position engaging the seat and an open position spaced from the seat, said body mounted valve seat finishing machine comprising:

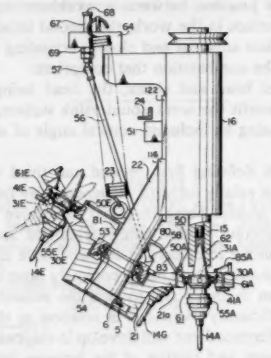
a stationary housing having axially spaced sections interconnected by a shaft member; means carried by the housing engageable with said surfaces for coaxially positioning the shaft with respect to the control axis; tool holder means including valve seat profile forming means; means rotatably and reciprocably supporting the tool holder means on the shaft member for axial movement along the control axis and rotation thereabout; carrier means rotatably supported on the tool holder support means; means preventing relative rotation between the carrier means and the housing; drive means operatively connected between the tool holder support means and the carrier means for rotating the tool holder means about the shaft member; first feed means operatively connected between the housing and the tool holder means for axially moving the latter, the carrier means and the drive means as a unit along the shaft; and second feed means for moving said profile forming means radially with respect to the tool holder means and shaft member whereby the profile forming means can be positioned axially and radially with respect to the axis for performing finishing operations on the valve seat.

4,050,837

DRILLING MACHINE WITH AUTOMATIC TOOL CHANGER

Hiromichi Shichida, Hino; Hideo Katsube; Shigeaki Oyama, both of Hachioji; Kenichi Toyoda, Hino, and Mitsuo Saito, Tokyo, all of Japan, assignors to Fujitsu Fanuc Limited, Hino, Japan

Filed July 8, 1976, Ser. No. 703,368
Claims priority, application Japan, July 15, 1975, 50-85865
Int. Cl.² B23B *39/20*
U.S. Cl. 408—35 **7 Claims**



1. A drilling machine with an automatic tool changer comprising longitudinally traversable spindle head including driving means therefore; a spindle rotatable held by said spindle head; a bar one end of which is slidably supported by said spindle head; a tool magazine which is intermittent-rotatably supported by the other end of said bar; a plurality of tool arbors for holding tools, rotatably held by said tool magazine, each of said tool arbors being detachable from said spindle and driven to rotate by said spindle; wherein the improvement comprises a cam plate fixed to said bar, and a plurality of support rings for rotatably supporting said tool arbors, each of said support rings being swingably attached to said magazine and having means engaging said cam plate and being supported for swing movement in the tool magazine between a working position in which the tool arbor is aligned with the axis of said spindle and a non-working position in which the tool arbor is retracted responsive to relative rotation between said magazine and said cam.

4,050,838

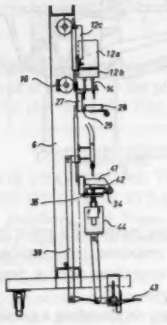
ARRANGEMENT FOR DRILLING HOLES TO APPLY BUILDERS' HARDWARE ON WINDOWS

Jakob Kneip, Haus near 32, 5401 Mermuth, Germany

Filed Oct. 30, 1975, Ser. No. 627,044
Int. Cl.² B23B *39/18*
U.S. Cl. 408—46 **10 Claims**

1. An arrangement for drilling holes to apply builders' hard-

ware to windows comprising, in combination, a framework with two sides members; an upper mounting rail between said side members for receiving a blind or sash frame of a window; a stop rail attached to said mounting rail; fixed drilling means having two drilling units and a plurality of lowerable spindles above said mounting rail and at the center thereof; two tubular members above and parallel to said mounting rail; two auxiliary drilling units with a plurality of lowerable spindles on said tubular members and movable synchronously in opposite directions; cable connecting means connecting said two auxiliary drilling units so that movement of one of said auxiliary drilling units displaces the other auxiliary unit synchronously in the



opposite direction, displacements of said auxiliary drilling units being relative to said fixed drilling means; linear displacement of one auxiliary drilling unit being transmitted directly through said cable connecting means to the other auxiliary unit for displacing said other auxiliary unit synchronously in the opposite direction, said cable connecting means comprising two runs of cable, each run being movable in opposite direction, each drill unit being attached to a separate run; first stop means abutted by said auxiliary drilling unit when drilling holes for a blind frame; and second stop means abutted by said auxiliary drilling unit when drilling for a sash and casement window frame, said second stop means being tiltable upward.

4,050,839

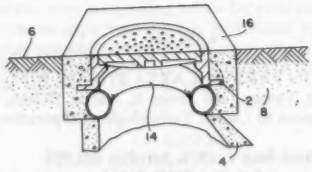
PROCESS FOR RAISING MANHOLES

Ronald D. Vollmar, 1809 Clark St., Muncie, Ind. 47301

Filed Aug. 27, 1976, Ser. No. 718,125

Int. Cl.² E03F *1/00*; E02D *29/14*

U.S. Cl. 404—72 **1 Claim**



1. A process for supporting a manhole frame and obtaining a seal between a manhole frame and a sewer catch basin, comprising the steps of:

a. positioning a manhole frame in a desired position relative to an opening in a sewer catch basin;

b. placing a flexible, resilient, air tight expandable means within the interior opening of the manhole frame and catch basin opening against the inner surfaces of said manhole frame and said sewer catch basin opening;

c. inflating said expandable means to expand said expandable means into contact with the inner surfaces of said manhole frame and said sewer catch basin opening

d. placing sealing and supporting material around the exterior of said expandable means in sealing and supporting contact with said manhole frame and said sewer catch basin; and,

e. removing said expandable means from the interior of said sealing and supporting material, said manhole frame, and said sewer catch basin.

4,050,840

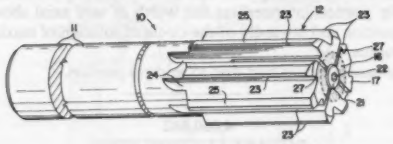
RADIALLY ADJUSTABLE ROTARY CUTTING TOOL

Thomas Jerome Skingle, Parma, Ohio, assignor to Acme-Cleveland Corporation, Cleveland, Ohio

Filed Apr. 1, 1975, Ser. No. 564,065

Int. Cl.² B23B *27/14, 51/00*

U.S. Cl. 408—144 **4 Claims**



1. In a rotary cutting tool with a cutting head having a generally cylindrical body with a threaded axial bore and a plurality of longitudinally extending radial slots extending through to the bore to accommodate radial expansion of the cutting head, and an expansion element threaded into said bore and adapted when turned into said bore to radially expand the cutting head, the improvement wherein said cutting head comprises an inner core portion consisting of low to medium alloy carbon steel and an annular outer portion consisting of a tool steel and metallurgically bonded to said core portion at an annular interface region, said annular outer portion being shaped to define a plurality of integral, circumferentially shaped longitudinally extending cutting surfaces.

4,050,841

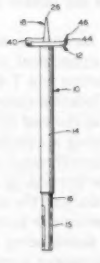
POWER BORING BITS

William J. Hildebrandt, West Simsbury, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Mar. 15, 1976, Ser. No. 666,783

Int. Cl.² B23B *51/00*

U.S. Cl. 408—213 **20 Claims**



1. A power boring bit comprising:

a. a shaft member having an elongated shank portion and a pointed tip portion at one end thereof configured to provide cutting surfaces along a segment of its axial length extending from the point of said tip portion, said cutting surfaces circumscribing a circle of rotation of maximum radius at a location along the length of said tip portion spaced from said point thereof, said tip portion having a generally axially extending planar shoulder portion

spaced from said point with the radial distance to said shoulder portion being less than said maximum radius, said shoulder portion having a length dimension extending axially of said shaft member and a width dimension extending perpendicularly to said length dimension;

b. a cutter disc having a planar body portion and a centrally disposed aperture therethrough receiving and extending about said tip portion at said axial shoulder portion, said cutter disc having a channel therein extending from the circumference thereof to said centrally disposed aperture therethrough, one edge portion bounding said channel extending at an angle from said plane of said body portion of the disc toward said point of said tip portion to provide a cutting lip portion with a root end adjacent said body portion of said disc and a free end spaced therefrom towards said point, said free end of said cutting lip portion having a cutting edge extending from the periphery of said disc to closely adjacent said axial shoulder portion of said tip portion intermediate the width of said axial shoulder portion and inwardly of the circle of rotation of maximum radius; and

c. means bonding said disc to said tip portion.

4,050,842

ROTARY CUTTING TOOL

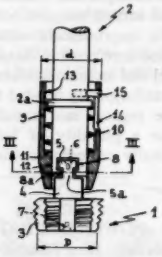
André Janin, 33, Boulevard Gambetta, Belleville-sur-Saone, France (69220)

Filed May 26, 1976, Ser. No. 690,346

Claims priority, application France, June 4, 1975, 75.18156

Int. Cl.² B23B *31/08*; B23G *51/00*

U.S. Cl. 408—226 **5 Claims**



1. A rotary cutting tool and quick-change tool holder operative to support the tool in a floating engagement permitting the tool to shift transversely of the holder through a limited distance, comprising:

a. a rotary cutting tool having an annular active cutting element and having a cylindrical shank extending therefrom, the shank terminating in a T-shaped tongue portion which is undercut at a location spaced from the end of the shank to leave a head at the end of the shank;

b. a tool support comprising a cylindrical holder having a transverse T-slot cut therethrough and shaped to recieve the head of the tongue portion as a clearance fit in the inner portion of the T-slot and the undercut portion of the tongue portion as a clearance fit in the outer portion of the T-slot, the cylindrical shank being adjacent to the cylindrical holder when the tongue portion is in the T-slot;

c. a sleeve member having a bore which is a snug sliding fit on said cylindrical holder and a clearance fit on said shank;

d. yieldable means normally maintaining the sleeve with its bore surrounding the cylindrical holder and surrounding a portion of the length of the shank between the tongue portion and the cutting element; and

e. the clearance between the sleeve bore and the portion of the shank which it overlies limiting said transverse shifting of the tool in the holder.

4,050,843

GAS TURBINE ENGINES

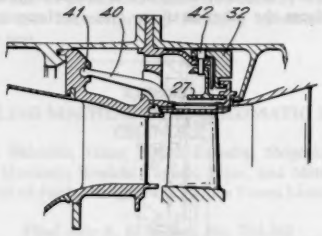
Peter Richard Needham, Bristol, and Kenneth Richard Langley, Wotton-under-Edge, both of England, assignors to Rolls-Royce (1971) Limited, England

Filed Nov. 24, 1975, Ser. No. 634,849

Claims priority, application United Kingdom, Dec. 7, 1974, 52995/74

Int. Cl.² F01D *25/26*

U.S. Cl. 415—116 **15 Claims**



1. A gas turbine engine including a rotor having a relatively slow thermal growth response rate disposed adjacent non-rotating structure for operation over a range of speeds and temperatures, comprising:

an annular sealing ring surrounding a portion of the rotor to define a clearance therewith and being capable of radial expansion and contraction,

means defining first and second radially inwardly facing surfaces on the ring,

a first annular control member having a relatively high thermal growth response rate and having means for engaging and supporting at least a portion of the first surface of the ring,

a second annular control member having a relatively low thermal growth response rate and having means for engaging and supporting at least a portion of said second surface of the ring, the surfaces of the ring and the engagement means on the control members being so juxtaposed that during any rapid increase in the operating temperature of the engine the ring is supported and expanded by the first control member and during any rapid decrease in the engine operating temperature, the ring is supported by the second control member and is constrained to contract at the same rate of contraction as said second control member.

4,050,844

CONNECTION BETWEEN VANE ARM AND UNISON RING IN VARIABLE AREA STATOR RING

Guy W. Miller, Vernon, and James R. Norris, Bolton, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed June 1, 1976, Ser. No. 691,920

Int. Cl.² F04D *29/52*

U.S. Cl. 415—147 **8 Claims**

1. In a variable vane stator structure,

a row of vanes arranged in a ring,

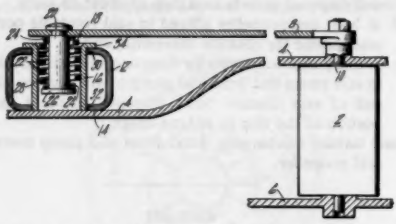
a shroud in which each of said vanes is pivoted for rotation about substantially a radial axis,

a crank arm on each vane,

an actuating ring for the row of vanes, said ring being connected to the ends of the crank arms remote from the vane, and

connecting means between the ring and arm including a pin on said arm,

a cooperating sleeve on the actuating ring surrounding and spaced from the pin, and



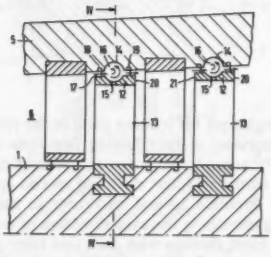
an elliptical shaped resilient member in the form of a coil spring secured at its ends to the pin and engaging with and slidable in the sleeve on the ring.

4,050,845

DEVICE FOR STABILIZING THE POSITION OF ROTORS OF LARGE STEAM TURBINES

Rudolf Gemein, Duisburg, and Franz Wotschofsky, Mulheim, both of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim, Germany

Filed Sept. 22, 1976, Ser. No. 725,526
Claims priority, application Germany, Sept. 30, 1975, 2543689
Int. Cl.[2] F01D *5/20;* **F04D** *29/66*
U.S. Cl. 415—172 A **8 Claims**



1. In a steam turbine having a rotor and a stator, the rotor having rotor blade rings at the outer periphery thereof and the stator having a carrier for vanes interposed between the rotor blade rings respectively in axial direction of the rotor, the rotor blade rings having respective shroud bands at the radially outer periphery thereof, the shroud bands and the stator carrier defining gaps therebetween, a device for stabilizing the position of the rotor comprising means for enlarging at least a part of the radial gaps, respectively, said means comprising channels of substantially circular cross section each extending in the form of a crescent in peripheral direction of the turbine over at least an upper half of the turbine.

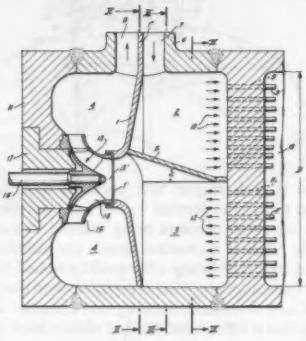
4,050,846

FLUID CIRCULATING APPARATUS

Wolfgang Metzinger, Grossniedesheim; Bernd Böll, Frankenthal, and Peter Hergt, Ludwigshafen, all of Germany, assignors to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal, Germany

Filed June 22, 1976, Ser. No. 698,747
Claims priority, application Germany, June 25, 1975, 2528210
Int. Cl.[2] F04D *29/44, 29/40*
U.S. Cl. 415—182 **6 Claims**

1. In a fluid circulating apparatus, a combination comprising a hollow housing having an inlet port and an outlet port arranged adjacent each other in a common tubular socket provided in one wall of said housing, and including internal partitions subdividing the interior of the housing into a first chamber communicating with the outlet port, and a second chamber including a first compartment communicating with said inlet port and a second compartment, said partition including a funnel-shaped member and extending transversely through said housing and having a central opening providing communication between said second compartment and said first chamber, and an inclined wall separating said first compartment from said second compartment, said funnel-shaped member extending with peripheral portion thereof through said socket



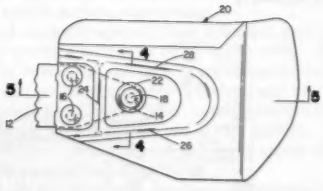
and separating said ports from each other, said housing further having at least one first aperture through which fluid which enters said first compartment via said inlet port can leave said first compartment and at least one second aperture through which fluid leaving said first compartment via said first aperture can enter said second compartment; and a circulating pump installed in said first chamber and arranged to draw fluid through said central opening in said funnel-shaped member from said second compartment and to discharge pressurized fluid into said first chamber and from the latter through said outlet port.

4,050,847

LIGHTWEIGHT FAN

Gordon R. A. New, and William G. Curry, both of Chatham, Canada, assignors to Fram Corporation, East Providence, R.I.

Filed Aug. 30, 1976, Ser. No. 718,789
Int. Cl.[2] F04D *29/34*
U.S. Cl. 416—132 A **9 Claims**



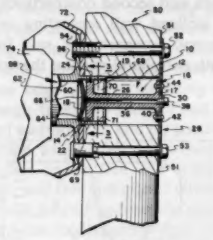
1. In a fan comprising a hub having a plurality of arms extending radially therefrom and a fan blade connected by rivets to each said arm and extending radially outwardly therefrom, said rivets located at positions radially spaced along each said arm and blade and the radially outermost of said rivets bearing directly against said blade, the improvement in which said fan blade has a circular rib formed therein extending about said radially outermost rivet and closely adjacent the head of the radially outermost rivet securing said blade to a said arm.

4,050,848

HYDRO SEAL RETAINER

Paul J. White, 809 Olive St., Vista, Calif. 92083

Filed Mar. 29, 1976, Ser. No. 671,349
Int. Cl.² B64C 11/08
U.S. Cl. 416—146 A 4 Claims



1. In an aircraft engine that normally supplies oil under pressure to a chamber formed by the front portion of a crankshaft, said oil under pressure being utilized to manipulate the blade angle pitch of a constant speed, controllable pitch propeller, said chamber being subsequently sealed off at its exit end by an expansion plug that is engaged with the interior wall portion of said crankshaft forming said chamber when a fixed pitch propeller is substituted for said controllable pitch propeller, the improvement which comprises:

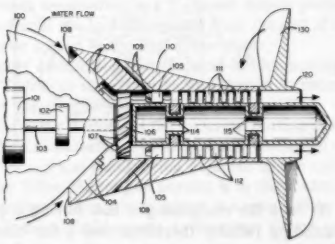
a backup seal apparatus positioned downstream and adjacent to said expansion plug, said apparatus having outer peripheral walls that conform concentrically with and are sealingly engaged with said interior wall portion formed by said crankshaft to prevent escape of said oil under pressure if said expansion plug should fail, said backup seal apparatus having a first oil seal end and a second seal retaining end, said second seal retaining end positioned downstream of said first end and connected to said first seal end by a shaft means therebetween, said second retaining end having at least a pair of flanges extending outwardly therefrom 180 degrees apart adapted to accept at least two of the fixed pitch propeller retaining bolts through holes formed in said flanges to retain said backup seal apparatus within said chamber.

4,050,849

HYDRODYNAMIC TRANSMISSION FOR SHIP PROPULSION

Herman E. Sheets, 87 Neptune Drive, Groton, Conn. 06340

Filed Apr. 19, 1976, Ser. No. 678,392
Int. Cl.² B63H 11/04, 23/26
U.S. Cl. 416—171 11 Claims



1. Apparatus for propelling a ship through a body of water by means of the combined thrust of a water jet and a propeller driven by a hydrodynamic transmission, said apparatus comprising in combination:

a. power means within the ship;

b. an axial flow pump rotated by said power means;

c. an axial flow turbine having at least one rotatable portion, said turbine being mechanically free of said power means and disposed outside said ship adjacent its stern;

d. at least one propeller affixed to said rotatable portion of said turbine for rotation therewith; and,

e. primary channel means for directing water from said body to said pump and from said pump to said turbine, the inlet end of said channel being disposed adjacent the stern portion of the ship to reduce drage;

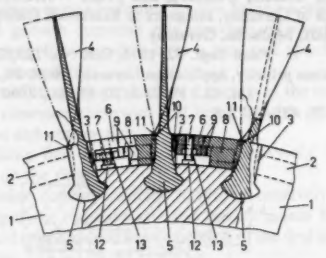
said turbine discharging water from said pump centrally of said propeller.

4,050,850

ARRANGEMENT FOR LOCKING PARTS INTO THE ROTOR OF A TURBOMACHINE

Wolfgang Beckershoff, Fislisbach, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Jan. 19, 1976, Ser. No. 650,061
Claims priority, application Switzerland, Jan. 30, 1975, 1105/75
Int. Cl.² F01D 5/32
U.S. Cl. 416—221 22 Claims



1. An arrangement for locking parts in the rotor of a turbomachine comprising a rotor having first slots extending circumferentially around said rotor and second slots extending transversely across said first slots and spaced apart in the circumferential direction around said rotor so that said second slots extend generally in the axial direction of said rotor, rotor parts having roots thereon with each said rotor part having its roots fitted into one of said second slots so that the roots of said rotor part are spaced apart in the circumferential direction by the said first slots, and locking means positioned within said first slots and displaceable only in a plane transverse to said second slots and passing through said first slots for movement therein between a release position and a locking position, said locking means having outer end faces disposed in locking engagement with the surface of the roots of said rotor parts when in the locking position, said outer end faces of said locking means being displaced from locking engagement with said rotor parts when in the release position, and said locking means being incompressible along the direction of said first slots when in the locking position.

4,050,851

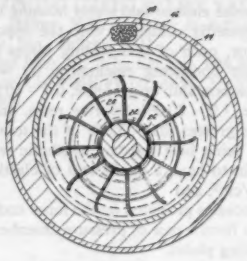
LIQUID RING PUMPS AND COMPRESSORS USING A FERROFLUIDIC RING LIQUID

Harold K. Haavik, South Norwalk, Conn., assignor to The Nash Engineering Company, Norwalk, Conn.

Filed Nov. 10, 1975, Ser. No. 630,845
Int. Cl.² F04C 19/00
U.S. Cl. 417—68 10 Claims

1. A liquid ring pump or compressor comprising a casing, a rotor mounted for rotation within said casing and defining, at least in part, a plurality of working chambers, port means through which a pumped medium is admitted to and discharged from said chambers, said casing including at least a

portion eccentric to said rotor, a quantity of ferromagnetic liquid within said chamber whereby, upon rotation of said rotor, said chambers are caused alternately to expand and contract, electrical coil means disposed to induce a field within



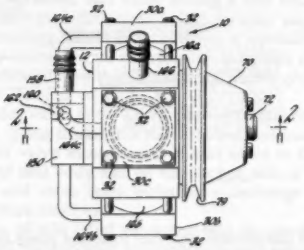
said casing to cause said ferromagnetic liquid to form a rotating ring, impingement of said ring on said rotor causing the rotor to turn, said coil means and liquid together constituting electrical motor means of which said liquid constitutes a rotor.

4,050,852

VARIABLE DISPLACEMENT RADIAL PISTON COMPRESSOR

Byron L. Brucken, Miamisburg, and Roy E. Watt, Brookville, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 13, 1976, Ser. No. 722,643
Int. Cl.² F04B *1/24, 49/00*
U.S. Cl. 417—273 **3 Claims**



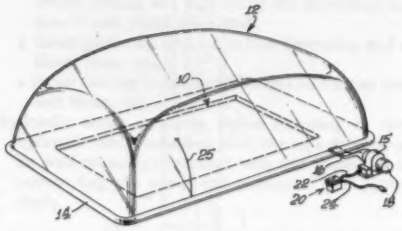
1. A radial compressor comprising a housing having a plurality of symmetrical bores therein radiating from a common chamber in said housing, a drive shaft journalled in said housing with its axis intersecting all the axes of the bores, said shaft having a wobble plate supported thereon at some predeterminated angle thereto so as to be rotatable therewith, said wobble plate encircled by an outer ring member journalled on the periphery thereof such that said wobble plate is free to rotate relative to said ring member, piston means operating within all of said bores, rod members drivingly connecting each of the piston means to said ring memer, said rod members in the form of circumferentially spaced connecting rods extending from said ring member into each bore, each said rod universally connected to the piston means in its associated bore, means hingedly connecting one of said rods to said ring member for pivotal movement solely about an axis substantially normal to the axis of said shaft, the remaining rods having their ring ends universally connected to said ring member, whereby said one rod hinge connecting means is operable to prevent said ring member from rotating with said wobble plate during the rotational movement of said shaft, and whereby said wobble plate imparts a single working stroke toggle action to each rod for driving each of the piston means through one working stroke reciprocation in its associated bore during each 180° rotation of said shaft, whereby each of the piston means will travel through two working stroke reciprocations in its associated bore for each 360° rotation of said shaft.

4,050,853

RAIN-RESPONSIVE CONTROL

Armand J. Pereyra, 104 W. C St., Ontario, Calif. 91761

Filed Nov. 14, 1975, Ser. No. 632,091
Int. Cl.² F04B *49/00;* E04H *3/16;* H01H *29/00*
U.S. Cl. 417—44 **8 Claims**



8. The combination of: a control circuit,
means in the control circuit to inflate a cover for a swimming pool,
means for sensing falling rain and energizing said inflating means in response to falling rain,
a selector switch having a first position and a second position,
said selector switch at its first position permitting the responsive switch to energize inflating means in the event of falling rain,
said selector switch at its second position energizing the inflating means independently of the responsive switch,
whereby with the selector switch at its first position a person desiring to use the swimming pool in the absence of rain may turn the selector switch to its second position to inflate the swimming pool cover and may later return the selector switch to its first position to deflate the swimming pool cover and to reset the control circuit for operating the inflating means in response to falling rain.

4,050,854

FLUID LIFTING APPARATUS

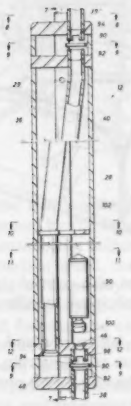
Judson A. Hereford, 5827 Vena Drive, Houston, Tex. 77087, and Franklin Beard, 14906 Cindywood, Houston, Tex. 77079

Filed Oct. 4, 1976, Ser. No. 729,857
Int. Cl.² F04F *1/08, 1/12*
U.S. Cl. 417—121 **13 Claims**

1. Apparatus for lifting fluid from the bottom of a well in stages to the earth's surface, comprising:
a plurality of vertically spaced lifting cylinders, each of said cylinders having a fluid inlet and a fluid outlet,
a plurality of flow tubes, one each being connected between the inlet and outlet of adjacent cylinders, said flow tubes and cylinders providing a closed conduit for the flow of fluid from the well bottom to the earth's surface,
a plurality of check valves, one of said check valves being in series with each of said fluid inlets,
a plurality of vertical barrels, one barrel positioned within each of said cylinders of external diameter less than the internal diameter of said cylinder, each barrel communicating at its upper end to the cylinder fluid outlet and at its lower end with a bottom chamber communicating with the cylinder fluid inlet,
a first air line extending from the earth's surface and ported into the bottom cylinder and each alternate cylinder thereabove,
a second air line extending from the earth's surface and ported into the next-to-bottom cylinder and each alternate cylinder thereabove,

means for alternatively applying air pressure to said first and second air lines, each of said air lines being vented while the other of said air lines is being pressured, and

a plurality of valve means for determining the fluid flow from said cylinders, one of said fluid flow valve means being in each of said cylinders communicating with said bottom chamber therein, each of said fluid flow valve means having a float therein for closing said valve when the fluid in the cylinder is below a predetermined level,



whereby fluid in each of said cylinders ported to the one of said air lines being pressured is pressured downwardly through its fluid flow valve means into the bottom chamber to close the check valve in series with the fluid inlet and to flow upwards through said chamber and said barrel to the next adjacent cylinder thereabove, to positively open the check valve to said next adjacent cylinder and said fluid flow valve means therein to permit filling said next adjacent cylinder with fluid.

4,050,855

DRY AIR ROTARY PUMP OR COMPRESSOR

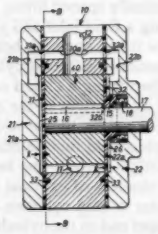
Hiroshi Sakamaki, Utsunomiya, and Toshiyuki Maeda, Ageo, both of Japan, assignors to Nippon Piston Ring Kabushiki Kaisha and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of Japan

Filed Jan. 30, 1976, Ser. No. 653,953

Claims priority, application Japan, Feb. 26, 1975, 50-23583; Feb. 26, 1975, 50-26136[U]

Int. Cl.[2] F04C *15/00*

U.S. Cl. 418—131 **6 Claims**



1. A dry air rotary pump or compressor comprising:

a stator housing having a cylindrical inner wall;

a pair of end heads mounted on the opposite ends of said stator housing to form a cylindrical pump cavity;

a drive shaft eccentrically journalled on one of said end heads, and extending in the interior of the pump cavity;

a rotor mounted on said drive shaft within said pump cavity and co-operating with the cylindrical inner wall of said stator housing and with the inner end walls of said end heads to form suction and compression or delivery chambers;

a pair of flexible diaphragm type sealing plates clamped on the opposite ends of said stator housing by said end heads to be pressedly contacted with the opposite end faces of said rotor, each of said sealing plates being made of a composite consisting essentially, by weight, of 10.0 – 75.0% carbon and/or graphite, 0.1 – 60.0% molybdenum disulfide, 1.0 – 20.0% fluorine resin, and the remainder, which is greater than 25.0% of the total composition by weight, being heat resistant synthetic resin without fluorine resin to have a coefficient of elasticity greater than 200 Kg/cm^2; and

a pair of recesses provided on the inner end walls of said end heads to form a pair of pressure chambers behind each of said sealing plates.

4,050,856

DASH POT ARRANGEMENT FOR DISTRIBUTION-TYPE FUEL INJECTION PUMP CUT OFF BARREL

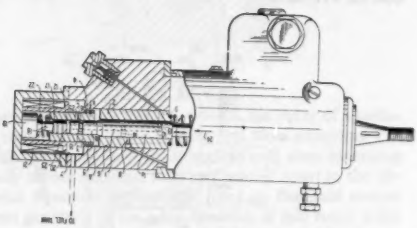
Masayoshi Kobayashi, Kawagoe, and Yasutaka Yuzawa, Kumagaya, both of Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Division of Ser. No. 561,530, March 24, 1975, Pat. No. 3,989,021. This application Mar. 10, 1976, Ser. No. 665,482

Claims priority, application Japan, Mar. 22, 1974, 49-31699[U]; Mar. 22, 1974, 49-31700[U]; Mar. 22, 1974, 49-31701[U]

Int. Cl.[2] F04B *49/00, 7/04, 39/10*

U.S. Cl. 417—289 **3 Claims**



1. In a distribution type fuel injection pump having a casing, a bore within said casing, inlet and outlet fuel channels in said casing and bore, a cylindrical plunger barrel fixedly mounted within said bore, an axially slidable and rotatable plunger mounted within said plunger barrel, a cut off sleeve slidably mounted on said slidable and rotatable plunger for relative movement with respect to said plunger and said casing, an end plug slidably and sealably mounted within said sleeve and forming with the end of said plunger a fuel compression chamber, a fixed magnetic core carried by said casing in contact with said end plug and limiting axial movement of said end plug in a direction out of said sleeve, an electromagnetic coil fixed to said sleeve and concentrically surrounding said core and axially movable thereon in a direction away from said plunger barrel in response to energization thereof, means spring biasing said coil and said sleeve in a direction towards said cylinder plunger barrel, a axial channel running from said compression chamber axially through a portion of said plunger, first, second and third radial channels within said plunger intersecting said axial channel and positioned for communicating with said inlet and outlet fuel chambers and for opening up to the periphery of said plunger, respectively, a radial cut off channel within said cut off sleeve and movable to a position and alignable with the third radial channel of said plunger to relieve fuel within said compression chamber at cut off, the improvement comprising: means defining a dash pot chamber between said casing, said plunger barrel and said cut

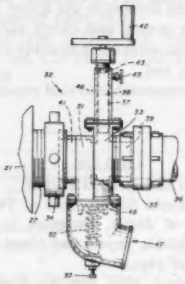
off sleeve for dampening movement of said cut off sleeve towards said plunger barrel.

4,050,857

INCOMING GATED RELIEF VALVE

Paul A. Leach, Jaffrey, N.H., assignor to Jaffrey Fire Protection Company, Inc., Jaffrey, N.H.

Filed May 14, 1976, Ser. No. 686,385
Int. Cl.[2] F04B *49/00*; A62C *27/20*
U.S. Cl. 417—309 **2 Claims**



1. In combination:

a fire engine pump having at least one pressure outlet for connection to a fire hose for fighting a fire and having at least two suction inlets for connection to a source of fire fighting liquid;

a water supply conduit connected to one said inlet;

an incoming, gated, valve threadedly mounted on another of said suction inlets, said valve having a thin body with a horizontally extending main valve chamber and a vertically extending valve gate chamber; a normally-closed, manually-operable gate reciprocable in a plane normal to the direction of flow through said main valve chamber, in said gate chamber

an air bleeder valve in the upper portion of said body

and a coil spring-biased, normally closed, automatic pressure-relief valve incorporated in said valve in the lower portion of said body and on the suction side of the gate thereof; said valve body including a discharge vent for said pressure relief valve

the location of said relief valve and said air bleeder valve inside said reciprocable gate enabling said valves to relieve undue air and water pressure in said pump despite said gate being closed.

4,050,858

WELL PUMPING APPARATUS

Phillip K. Ewbank; Charles R. Ewbank, and Garen N. Ewbank, all of 513 N. Main, Fairview, Okla. 73737

Filed Apr. 5, 1976, Ser. No. 674,012
Int. Cl.[2] F04B *17/00*; F04D *13/04*
U.S. Cl. 417—234 **1 Claim**

1. In combination with a water well pumping apparatus having an engine driving a reel mounted on a base disposed adjacent a well to be pumped, a plurality of hoses including a well fluid discharge hose connected at one end with said reel and windable thereon, a hydraulic pump driven by said engine and connected with a pair of hoses of said plurality of hoses and having a generally cylindrical pump assembly adapted to be connected at one end with the other end of said plurality of hoses and lowered vertically into the well to be pumped, the pump assembly having an impeller equipped pump contained by a pump housing at its depending end portion, at least one fluid elevating staging means coaxially connected with the upper end of the pump housing and including a coaxial pump drive shaft connected with the impeller at the depending end portion of the pump drive shaft and having a hydraulic motor drivably connected with the upper end of the pump drive shaft, the improvement comprising:

pump drive shaft support means including a centrally bored thrust body coaxially surrounding the depending end portion of said pump drive shaft and connected with said pump housing, said thrust body having a counterbore in its depending end;

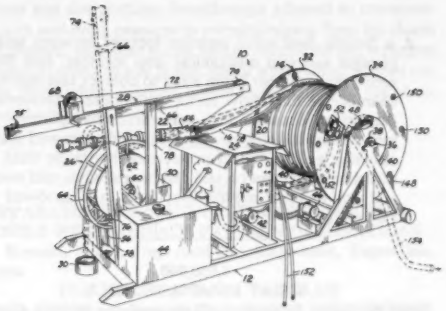
thrust bearing means secured within the thrust body counterbore

said thrust bearing means including a thrust plate having a socket nesting and supporting the depending end portion of said pump drive shaft,

a thrust plate cap secured to the depending end of said thrust body, and,

a thrust bearing interposed between said thrust plate and said thrust cap;

hydraulic motor mounting means including an apertured hydraulic motor mounting plate having a depending annular wall coaxially connected with said staging means and surrounding the upper end portion of said pump drive shaft;



a bushing receiving sleeve coaxially disposed within said annular wall;

a bushing surrounding the upper end portion of said pump drive shaft including a stem portion coaxially received by said staging means and having an upstandng head portion at least partially disposed within said bushing sleeve;

sealing means comprising waterproof sealing rings interposed between said bushing head and said bushing sleeve and between said bushing stem and said pump drive shaft, respectively,

said bushing head having an annular groove in its wall surface surrounding said pump drive shaft and having a lateral port communicating with the groove,

said motor mounting plate annular wall having a lateral port coaxially aligned with the bushing head port;

a drain tube interconnecting the lateral ports;

a hydraulic motor surrounding sleeve coaxially secured to said motor mounting plate; and,

a motor mounting and hose connecting cap overlying the end of said motor mounting sleeve opposite said motor mounting plate.

4,050,859

DIAPHRAGM PUMP HAVING A REED VALVE BARRIER TO HYDRAULIC SHOCK IN THE PRESSURIZING FLUID

William Duncan Vork, Edina, Minn., assignor to Graco Inc., Minneapolis, Minn.

Filed July 1, 1976, Ser. No. 701,807
Int. Cl.[2] F04B *9/08*, *35/02*
U.S. Cl. 417—386 **13 Claims**

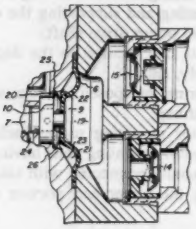
1. An improvement in diaphragm pumps of the type having a mechanically reciprocating member for pressurizing hydraulic oil for reciprocating a diaphragm member to transfer fluid

through inlet and outlet valves into and out of a pumping chamber adjacent a first side of the diaphragm, comprising:

a. a hydraulic chamber of containing hydraulic oil in fluid contact with said mechanically reciprocating member;

b. a diaphragm chamber adjacent a second side of said diaphragm and having a narrowed aperture opening into said hydraulic chamber;

c. a mechanical stop member connected to said diaphragm and sized to fit into said narrowed aperture opening; and



d. a flexible reed valve member secured between said diaphragm and said mechanical stop member, said flexible reed valve member being sized to contact said diaphragm chamber in fluid flow sealing relationship between said diaphragm chamber and said narrowed aperture when said mechanical stop member is in said narrowed aperture opening, and to deflect pressurized hydraulic fluid from direct impingement on said diaphragm when said mechanical stop member moves away from said narrowed aperture opening.

4,050,860

SPRAY PUMP ASSEMBLY

Steve W. Beres, Bridgeport, Conn., assignor to VCA Corporation, Baton Rouge, La.

Filed June 1, 1976, Ser. No. 691,220

Int. Cl.[2] F04B *21/04*

U.S. Cl. 417—444 **1 Claim**

1. A finger-operated spray pump assembly comprising:

a. compression chamber means, said compression chamber means having vent hole means in the wall thereof, and closure means rigidly connectable thereto, the lower end of said compression chamber means having a series of guide means connected to the inside wall thereof;

b. piston means slidably fitted in said compression chamber means;

c. grommet means rigidly connectable to said compression chamber means for connecting closure means to said compression chamber means;

d. hollow stem means having an upper end and a lower end, said upper end of said stem means being slidably fitted inside said grommet means, said stem means having actuator button means connectable to the upper end thereof, said stem means having shoulder means for contacting and forcing said piston means toward said check valve means, and said lower end of said stem means being slidably fitted in said piston means;

e. seal means slidably fitted in said lower end of said stem means, said seal means having base means, said base means having post means connected thereto, said post means being adapted for slidable receipt in said lower end of said stem means, said lower end of said stem means being adapted to urge said seal means away from sealing contact with said pistion means prior to said shoulder means contacting said piston means;

f. spring means fitted inside said compression chamber means to urge said seal means against said piston means;

g. check valve means located in the lower end of said compression chamber means, said check valve means having arm means thereon which are slidably received between said guide means; and,

h. dip tube means connectable to said compression chamber means.

4,050,861

DIAPHRAGM PUMP

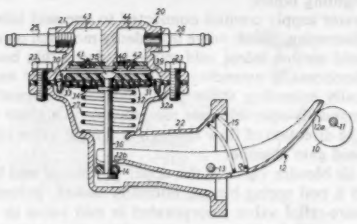
Toshimitsu Sakai; Tadashi Saitou, both of Toyota, and Isamu Suzuki, Aichi, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Aisan Kogyo Kabushiki Kaisha, Obu, both of Japan

Filed May 6, 1975, Ser. No. 574,876

Claims priority, application Japan, May 30, 1974, 49-62376[U]

Int. Cl.[2] F04B *43/02*; F01B *19/00*

U.S. Cl. 417—471 **2 Claims**



1. In an air diaphragm pump comprising a lower housing mounted on a stationary structure for forming a lubrication oil chamber therein; an upper housing coupled with said lower housing for forming an air pumping chamber therein and provided thereon with an inlet port and an outlet port; a spring-loaded diaphragm piston assembly including a flexible diaphragm interposed and hermetically clamped at the outer periphery thereof between said housings to define said air pumping chamber and an operation rod for reciprocating said diaphragm assembly within said oil chamber; valve means assembled within said upper housing and including a first check valve to suck the air into said air pumping chamber through said inlet port and a second check valve to discharge the sucked air though said outlet port; and a driving mechanism assembled within said lower housing for operating said operation rod;

the improvement comprising:

upper and lower protector plates located respectively within said air chamber and said lubrication oil chamber for fluid-tightly connecting said flexible diaphragm at the center thereof to said operation rod, said plates having substantially planar portions;

a flexible disc sealing member integral with said flexible diaphragm on the side thereof facing said lubrication oil chamber and clamped between said diaphragm and said lower protector plate;

the outer periphery of said flexible disc sealing member being interposed and fluid-tightly clamped with the

outer periphery of said diaphragm between said housings;

said flexible disc sealing member being interposed and fluid-tightly clamped between said lower protector plate and said diaphragm throughout the entire planar portion of said lower protector plate; and

a buffer member secured to said upper protector plate to protect said valve means.

4,050,862

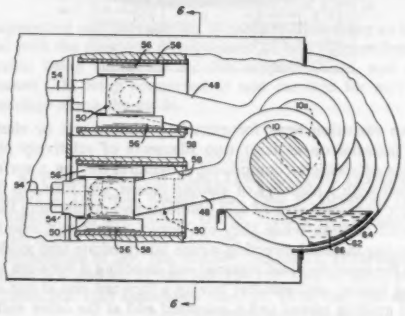
MULTI-PLUNGER RECIPROCATING PUMP

Frederic W. Buse, Allentown, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Nov. 7, 1975, Ser. No. 629,781

Int. Cl.[2] F04B *21/02, 21/04*

U.S. Cl. 417—539 **21 Claims**



1. A multi-plunger reciprocating pump comprising a generally horizontally extending crankshaft, a plurality of generally horizontally extending cylinders alternatively disposed at least generally above and below the centerline of said crankshaft, conduit means operatively associated with each of said cylinders for supplying fluid to, and discharging pumped fluid from, said cylinders, valve means for controlling fluid flow through said conduit means to-and-from said cylinders, a piston movably disposed in each of said cylinders for reciprocation therein, and connecting means connecting said crankshaft to said pistons such that rotation of said crankshaft causes driven reciprocation of said pistons in said cylinders, wherein said connecting means for each said piston comprises a connecting rod connected to said crankshaft to be driven thereby, a piston rod connected to the piston, and a crosshead connecting said connecting rod to said piston rod, and further comprising arcuate way means disposed adjacent two opposite sides of each said crosshead, arcuate bearing shoe means mounted to such two opposite sides of each said crosshead slidably supporting the crosshead on its said way means, and other arcuate shoe means mounted to each said crosshead intermediate its said acruate bearing shoe means, whereby 90° rotation of said crossheads causes said other shoe means to support said crosshead on said arcuate way means.

4,050,863

APPARATUS FOR THE HOT-PRESSING OF COMPOSITE BOARDS MADE FROM LIGNOCELLULOSIC MATERIAL

Nils Evert Erling Book, Motala, Sweden, assignor to Aktiebolaget Motala Verkstad, Motala, Sweden

Filed Dec. 1, 1975, Ser. No. 636,671

Claims priority, application Sweden, Dec. 4, 1974, 7415215; Mar. 5, 1975, 7502463

Int. Cl.[2] B29C *3/00*

U.S. Cl. 425—84 **5 Claims**

1. Apparatus for heat-pressing sheets of lignocellulosic material in a stationary press for forming lignocellulosic materials into boards during which time provision is made to allow draining of liquid, gas or steam from the sheets when being pressed and heated in the press, said apparatus comprising: a pair of vertically spaced heated press plate assemblies having flat, opposed, horizontally parallel surfaces of finite length; means in the upper surface of said lower press plate assembly defining drain passages for receiving gas, liquid or steam material compressed from said sheet and for conducting it horizontally; plate means for conveying a sheet of lignocellulosic material into the press between the opposed press plate assemblies which plate means defines interspersed rigid sheet support portions and slot portions therethrough adapted to communicate with said drain passages to permit draining from the sheets being pressed, said plate means being constructed and arranged to permit draining of any liquid, gas or steam being pressed out of the sheet while resisting plastic deformation of the sheet during the pressing action.

4,050,864

APPARATUS FOR MANUFACTURING CONCRETE PANELS WITH SURFACE PATTERN DECORATIONS

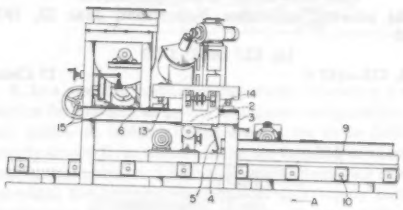
Saiji Komaki, No. 1, Nagayoshi-cho, Kagoshima, Kagoshima, Japan

Filed Nov. 26, 1975, Ser. No. 635,335

Claims priority, application Japan, Sept. 3, 1975, 50-106055

Int. Cl.[2] B28B *13/02*

U.S. Cl. 425—134 **7 Claims**



1. In an apparatus for manufacturing concrete panels with surface decoration patterns thereon, said surface decoration patterns being formed by finishing material containing color cement or pigments or other coloring material, said apparatus comprising a mortar hopper, having a mortar outlet opening, a mortar shoot extending downward from beneath the outlet opening of said hopper; a molding surface positioned below said mortar shoot, said mortar shoot extending toward said molding surface; color mortar containers disposed above the mortar shoot to discharge color mortar materials contained therein; a mixing means operatively associated with said mortar shoot for incompletely mixing the mortar with the color mortar materials on said mortar shoot; a mixed mortar inverting descent guide plate connected to the lower end of the mortar shoot; and a vibrator attached to the mortar shoot, wherein the mortar layer which is obtained with color patterns produced through the incomplete mixing carried out by said mixing means is laid on said molding surface by relative movement between said mixed mortar inverting descent guide plate and said molding surface.

4,050,865

BRICK PRESS AND ASSOCIATED EQUIPMENT FOR MAKING BRICKS

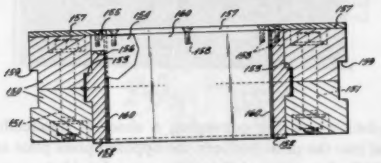
Frede Hilmar Drostholm, Vedbaek; Harry Jensen, Gentofte, and Per Willadsen, Melby, all of Denmark, assignors to Frede Hilmar Drostholm, Denmark

Continuation-in-part of Ser. No. 510,145, Sept. 30, 1974. This application Sept. 9, 1976, Ser. No. 721,867

Claims priority, application Australia, Sept. 25, 1975, 85165/75

Int. Cl.[2] B29C *3/00*; B29B *11/04, 11/08*

U.S. Cl. 425—183 8 Claims



1. A press for forming bricks comprising an open ended mold, means for introducing a charge of particulate material into one end of the mold, a pair of press elements adapted to enter the opposite ends of the mold, means for applying pressure through the press elements against the charge of material in the mold and for concurrently shifting the position of the press elements toward one end of the mold and thereby shift the mean position of the charge with respect to the side walls of the mold during application of pressure by the press elements and replaceable wear plates covering and adhesively secured to the side walls of the mold by an adhesive which is decomposable at elevated temperature.

4,050,866

APPARATUS FOR MELT-SPINNING

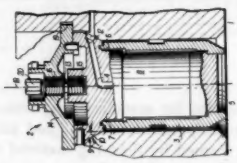
Harley Kilsdonk, Zevenaar, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Filed June 18, 1976, Ser. No. 697,481

Claims priority, application Netherlands, June 23, 1975, 7507443

Int. Cl.[2] D01D *3/00*

U.S. Cl. 425—192 S 17 Claims



1. An apparatus for the manufacture of synthetic threads by the melt-spinning method comprising a heating jacket, a spinning assembly disposed in the jacket, said spinning assembly having a housing having two open ends and surrounding a compartment for polymer to be spun, a spinnerette plate having spinning orifices across a first of said ends, a closure member having a first portion which fits in the second of said ends and a second portion which has a sloping face which extends radially outwardly from the first portion outside the housing, said jacket having a sloping surface which bears against the sloping face of the closure member, and means for producing polymer to be spun into the compartment including a bore through the sloping surface of said jacket which communicates with a bore through the sloping face of said closure member.

4,050,867

EXTRUSION HEAD FOR EXTRUDING PLASTOMERIC OR ELASTOMERIC MATERIAL ON FILAMENTS

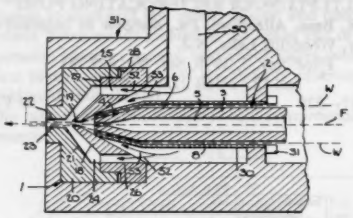
Antonio Ferrentino, Monza (Milan); Antonio Brovedan, Milan, and Angelo Sala, Merate, all of Italy, assignors to Industrie Pirelli Societa per Azioni, Milan, Italy

Filed Dec. 18, 1975, Ser. No. 641,980

Claims priority, application Italy, Dec. 20, 1974, 30785/74

Int. Cl.[2] B29F *3/10*

U.S. Cl. 425—114 9 Claims



1. An extrusion head for extruding plastomeric or elastomeric material on at least two filaments of relatively high modulus of elasticity comprising a mandrel having a surface provided with a plurality of guiding means, one for each filament for engaging each of said filaments and maintaining them in spaced relation while they are drawn across said mandrel and having material directing means intermediate said guiding means for receiving said material and directing it between said guiding means, said mandrel having a forward end at one end of said guiding means and a rearward end at the other end of said guiding means and said surface of said mandrel has a first cylindrical portion extending from said rearward end toward said forward end and a second portion intermediate said first portion and said forward end, said second portion tapering and decreasing from said first portion to said forward end and from the transverse dimensions of said first portion to smaller transverse dimensions, said guiding means following said surface and thereby guiding each of said filaments along a first path parallel to said first portion of said surface and then along a second path parallel to said second portion of said surface, said extrusion head further comprising a die at said forward end of said mandrel, said die having a central duct and an opening extending from said duct to said second portion of said mandrel, said opening being defined by a conical wall co-axial with said second portion and spaced, at least in part, from said second portion to define a space between sid conical wall and said second portion for the passage of said material between said conical wall and said second portion into said central duct, said central duct being in communication with said guiding means.

4,050,868

CASTING MACHINE FOR CASTING CONCRETE ELEMENTS

Esko Patamaa, 03100 Nummela, Finland

Filed May 11, 1976, Ser. No. 685,218

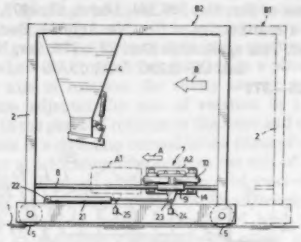
Claims priority, application Finland, May 13, 1975, 751397

Int. Cl.[2] B28B *1/08, 13/02*

U.S. Cl. 425—135 6 Claims

1. A casting machine for casting concrete elements, said casting machine comprising a support frame (2) situated for movement above a cast mould (3), said support frame including means (4) for feeding the concrete into the mould, a vibrating device (7) for vibrating the mould and a mechanism (6) for moving the support frame along the mould during feeding of the concrete, characterized in that said vibrating device (7) is mounted on said support frame so as to be glideable in the direction of movement (B) of the support frame (2), locking units (12, 14) being located on said vibrating device whereby

the vibrating device is adapted to be momentarily fastened, without play, to the casting mould (3) for the time of vibration irrespective of the continual movement of the support frame, a carriage (9) for supporting said vibrating device, a guide (8)



supporting said carriage for movement therealong an in parallel with the direction of movement of said support frame, said guide being supported by the support frame, and shifting means (21) being connected to said carriage for moving the carriage along the guide.

4,050,869

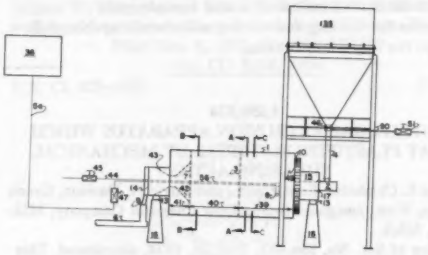
APPARATUS FOR AGGLOMERATING POWDERS

Robert B. Takewell, Borger, Tex.; Paul W. Brandon, Havre de Grace, Md., and Paul R. Odom, Macon, Ga., assignors to J. M. Huber Corporation, Locust, N.J.

Continuation of Ser. No. 450,037, March 11, 1974, abandoned, which is a division of Ser. No. 186,113, Oct. 4, 1971, Pat. No. 3,803,283. This application Mar. 18, 1976, Ser. No. 668,120

Int. Cl.[2] B29B *1/02*

U.S. Cl. 425—222 **1 Claim**



1. Apparatus for agglomerating finely divided materials such as clay, silica, or silicate pigments into a range of pellet sizes providing optimum density, packing efficiency, and attrition resistance, comprising:

a. a rotatable drum for receiving finely divided material and tumbling it until it is agglomerated;

b. pellet initiation means located within said rotatable drum for spraying liquid wetting agent, in a flat wide spray, on the finely divided material for encouraging it to agglomerate;

c. input conveying means passing into said rotatable drum for introducing finely divided material into said drum, said input conveying means including a screw conveyor comprising a non-rotatable shell and a rotatable shaft, and being connected to said rotatable drum by lubricated bushings;

d. inlet means opening into one end of said drum and attached to said conveying means for receiving said finely divided material to be agglomerated;

e. outlet means opening into the opposite end of said rotatable drum for receiving the agglomerated material from said drum;

f. pellet conveying means located at said outlet means for conveying the discharged agglomerated material away from said drum;

g. pre-wetting means attached to said input conveying means for adding from 0 to 5 percent wetting liquid to said finely divided material;

h. first motor means attached to said rotatable drum for providing rotary motion to said drum;

i. second motor means attached to said input conveyor means for providing conveyor drive power to said input conveyor means.

j. a first baffle within said drum for dividing said drum into compartments;

k. a second baffle within said drum between said first baffle and said outlet means for further dividing said drum into compartments; and,

l. a plurality of lifter trays located radially in said drum between said second baffle and said outlet means for lifting the pelleted material and funneling it out of said drum.

4,050,870

MOLDING PRESS HAVING A DEVICE FOR GRIPPING AND DELIVERING ELEMENTS TO BE MOLDED

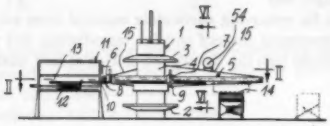
Vito Frigo, Cervignano del Friuli (Udine), Italy, assignor to Ausatuft S.p.A., Italy

Filed Sept. 3, 1975, Ser. No. 609,977

Claims priority, application Italy, Sept. 17, 1974, 27359/74

Int. Cl.[2] B29C *3/04*

U.S. Cl. 425—317 **6 Claims**



1. In a molding press, molding means situated at a molding station for molding an article to a given configuration, a delivery station to which molded articles are to be delivered, a supply station from which articles are supplied to be molded at said molding station, a pair of gripping means one of which is provided for gripping an article at said supply station and transferring the latter to said molding station and the other of which is provided for gripping an article molded at said molding station and transferring the latter to said delivery station, and moving means operatively connected to both of said gripping means for moving said one gripping means from said supply station to said molding station and for simultaneously moving the other gripping means from said molding station to said delivery station, said one gripping means gripping the article at said supply station and carrying the latter to said molding station and releasing the article at the latter station while said other gripping means simultaneously grips a molded article at said molding station and carries the latter to said delivery station for releasing the latter at said delivery station, a guide means extending across said molding station to one side thereof toward said supply station and to an opposite side thereof toward said delivery station, said moving means including a carriage movable along said guide means, a pair of arms carried by said carriage, and said pair of gripping means being respectively carried by said arms, each of said arms carrying at an end thereof a slide means, and said pair of gripping means being respectively slidable on the pair of slide means respectively situated at the ends of said arms.

4,050,871

APPARATUS FOR MAKING PELLETS USABLE AS AGGREGATE OR FILLER

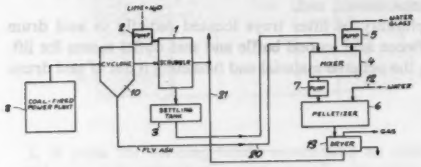
Ulrich Kleeberg, Muhlheim (Ruhr); Jürgen Leimkühler, Essen; Jürgen Knospe, Herbern, and Manfred Stöhr, Essen, all of Germany, assignors to Gottfried Bischoff Bau kompl. Gasreinigungs-und Wasserruckkuhlanlagen Kommanditgesellschaft and STEAG Aktiengesellschaft, both of Essen, Germany

Division of Ser. No. 593,670, July 7, 1975. This application May 17, 1976, Ser. No. 687,391

Claims priority, application Germany, July 6, 1974, 2432572

Int. Cl.[2] B29J *1/00*

U.S. Cl. 425—317 3 Claims



1. A plant for making hard and water-stable pellets usable as aggregate or filler, said plant comprising:

means including a scrubbing tower for treating a waste gas containing pollutants with water and lime to form a sludge containing said pollutants;

means connected to said tower for partially dewatering said sludge;

means connected to the dewatering means for mixing the dewatered sludge with a binder;

means connected to the mixing means for pelletizing said sludge; and

means for removing particulate material from said gas prior to treatment thereof and for introducing said particulate material into the dewatered sludge at said mixing means.

4,050,872

ROLLER CHAIN GUIDE ARRANGEMENT

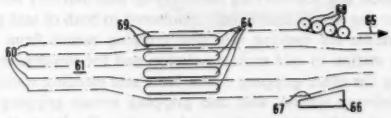
Karl-Heinz Ahrweiler, Krefeld, Germany, assignor to Eduard Kusters, Krefeld, Germany

Filed June 28, 1976, Ser. No. 700,346

Claims priority, application United Kingdom, Oct. 11, 1975, 2545624

Int. Cl.[2] B29C *15/00*; B27D *3/04*

U.S. Cl. 425—371 5 Claims



1. In apparatus in which a group of roller chains are disposed, packed closely together, side by side, and in such a manner that they can advance independently of each other, the group being disposed to advance in one area parallel to each other in a common plane, with at least some of the roller chains leaving the common plane at one point and re-entering the plane again, the improvement comprising guide means disposed so as to separate any chain which has left the common plane by a predetermined spacing from chains adjacent thereto before re-entering the common plane, and convergence means following said guide means for urging the chains transversely together until said roller chains reach close proximity at the point where said chains reenter said common plane.

4,050,873

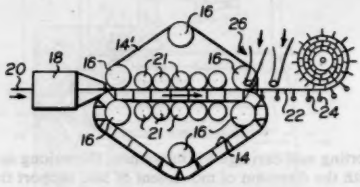
TRAIN MOLDING APPARATUS

George C. Brumlik, 154 Upper Mountain Ave., Montclair, N.J. 07042, and Bernard I. Bartner, 229-07 58th Ave., Bayside, Queens, N.Y. 11364

Continuation of Ser. No. 559,284, March 17, 1975, abandoned, which is a continuation of Ser. No. 317,034, Dec. 20, 1972, abandoned. This application Dec. 23, 1976, Ser. No. 754,085

Int. Cl.[2] B29C *7/00, 15/00*

U.S. Cl. 425—371 13 Claims



1. Continuous molding apparatus for molding a plurality of three dimensional articles comprising

a. carrier means adapted to travel in a first path followed by a arcuate path

b. a plurality of contiguous mold means, said mold means having transverse and mutually adjacent pairs of faces which are transverse with respect to the carrier means, mounted on said carrier means adjacent ones of said mold means forming undercut mold cavities in said transverse and mutually adjacent pairs of faces of said mold means when said carrier means travels in the said first path, said mold faces containing said undercut mold cavities separating from each other and opening said mold cavities when said carrier means travel in said arcuate path

c. means for feeding and forcing a material capable of flow into the said mold cavities.

4,050,874

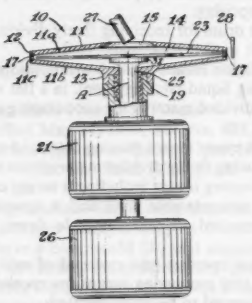
CENTRIFUGAL EXTRUSION APPARATUS WHICH HEAT PLASTIFIES MATERIAL BY MECHANICAL SHEARING ACTION

Douglas S. Chisholm, Kent, Conn., and David H. Dawson, Green River, Wyo., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 536,493, Dec. 26, 1974, abandoned. This application Feb. 25, 1976, Ser. No. 661,195

Int. Cl.[2] B29F *3/06*

U.S. Cl. 425—382 R 6 Claims



1. A centrifugal extruder adapted to receive particulate heat plastifiable material, heat plastify and discharge the material in heat plastified form, the centrifugal extruder comprising

a generally hollow discoidal rotor, the hollow discoidal rotor defining

a material receiving opening in communication with

a generally discoidal material receiving cavity,

a plurality of peripherally disposed extrusion openings, the extrusion openings being in full communication with the material receiving cavity, the material receiving cavity having a generally double tapered cross-sectional configuration when the cross-section is taken in a plane containing the axis of rotation, the cavity having a maximum dimension adjacent the axis of rotation in a direction normal to the plane of rotation of the rotor and a minimum dimension in a direction normal to the plane of rotation of the rotor at a location remote from the axis of rotation,

a shear means disposed within the material receiving cavity, the shear means being a generally planar shearing element defining spaces to permit particles of heat plastifiable material to distribute themselves on either side of the shearing element, the shearing element being adapted to rotate coaxially relative to the housing and having peripheral portions which approximate the diameter of the material receiving cavity, the shearing element being in spaced relationship to a surface of the housing defining the cavity and the extrusion orifices,

means operatively associated with the rotor to rotate the rotor and

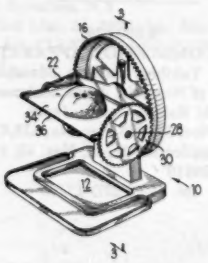
means operatively associated with the shearing element to rotate the shearing element in a like direction, the rotor and the shearing element being rotatable relative to one another to thereby apply shear to a particulate heat plastifiable material within the rotor, the shear causing the particulate material to become heat plastified and centrifugal force causing the heat plastified material to be discharged from the extrusion openings.

4,050,875

ARTS AND CRAFTS MOLDING DEVICE

Allison W. Katzman, and Albert G. Keller, both of Chicago, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Dec. 4, 1975, Ser. No. 637,729
Int. Cl.[2] B29C *5/04*
U.S. Cl. 425—429 **8 Claims**



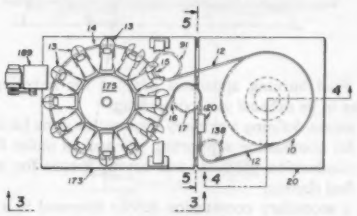
1. An arts and crafts device for molding hollow objects or the like from molten thermoplastic material to provide a hollow molded end product, which device comprises a frame having a base portion and a vertical carriage support, a carriage mounted on said carriage support for rotation about a first axis, a crank having a drive shaft mounted on said frame for rotation relative thereto and secured to said carriage for rotating said carriage, said carriage being in the form of a yoke having two opposing arms, a mold receiver including two generally planar sheets for holding a split mold, each half of said mold being secured to one of said sheets, means including a second frame and a second shaft mounting said mold receiver to and between said yoke arms for rotation relative thereto about a second axis generally perpendicular to said first axis, a crown gear on said frame concentric with said first axis, and a second gear mounted on said second shaft and enmeshed with said crown gear for tracking said crown gear while said carriage is rotated by said crank, thereby also rotating said mold on said second, perpendicular axis.

4,050,876

ROTARY STRETCH BLOW MOLDING APPARATUS

Ivan L. Kauffman, Commerce, and Robert C. Kellogg, Hartland, both of Mich., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 415,851, Nov. 14, 1973. This application May 5, 1976, Ser. No. 683,254
Int. Cl.[2] B29D *23/03*
U.S. Cl. 425—529 **11 Claims**



1. In a continuous motion stretch blow molding apparatus, for blow molding hollow articles from tubular parisons, the combination comprising:

A. a continuous motion transfer means;

B. a plurality of upwardly disposed stretch pin means operatively carried on said transfer means, each stretch pin means including:

a. a stretch pin body and a stretch pin provided with:

i. first passage means for conveying blow air into a parison carried on a stretch pin means to blow such parison into the shape of a final article;

ii. second air ejection passage means for conveying transfer air into said final article carried on such stretch pin means; and

b. valve means operatively associated with the air ejection passage means and responsive to the pressure of the blow air to prevent blow air from exiting through the air ejection passage means during forming of said final article;

C. a continuous motion rotary parison loading turret for receiving parisons and for sequentially loading them onto said stretch pin means;

D. a continuous motion rotary molding turret having a plurality of molding stations;

E. said transfer means being operative to locate each of said stretch pin means with a parison loaded thereon in an individual one of said molding stations for a stretching, blowing and cooling operation on each parison on each stretch pin means to form an article from each parison; and

F. pressurized fluid ejection means successively cooperable with the second air ejection passage means of each stretch pin means to eject each article upwardly from each stretch pin means.

4,050,877

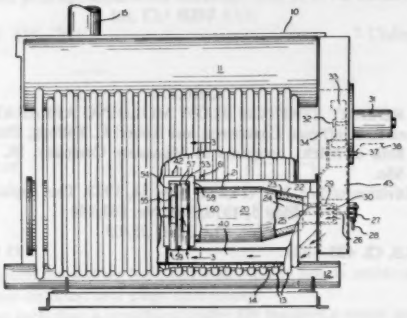
REDUCTION OF GASEOUS POLLUTANTS IN COMBUSTION FLUE GAS

Glenn D. Craig, Menomonee Falls; David T. Feuling, Milwaukee, both of Wis., and Paul G. LaHaye, Cape Elizabeth, Maine, assignors to Aqua-Chem, Inc., Milwaukee, Wis.

Division of Ser. No. 488,057, July 12, 1974, Pat. No. 3,955,909, which is a division of Ser. No. 295,249, Oct. 5, 1972, Pat. No. 3,837,788. This application Oct. 9, 1975, Ser. No. 620,953

Int. Cl.[2] F23N *5/08*

U.S. Cl. 431—76 **10 Claims**



1. Fuel burning apparatus adapted for reducing nitrogen oxides in its exhaust gas, comprising:

a. means defining a primary combustion zone having an inlet for combustion supporting gas and an outlet for gaseous combustion products and having means for introducing fuel therein,

b. a secondary combustion device disposed in a secondary combustion zone through which the gaseous combustion products flow from the primary zone,

c. a source of combustion supporting gas,

d. first flow control means constructed and arranged to conduct said gas to said primary combustion zone,

e. second flow control means constructed and arranged to conduct said combustion supporting gas to said secondary combustion zone by way of said device, and

f. means for sensing the level of carbon monoxide in the gaseous combustion products downstream of said secondary combustion device, said sensing means being operatively coupled to said second flow control means, said sensing means being responsive to the sensed level of carbon monoxide for operating said second flow control means to adjust the flow of said combustion supporting gas provided to said secondary zone in direct relation to the level of said sensed carbon monoxide.

4,050,878

ELECTRONIC CARBURETION SYSTEM FOR LOW EXHAUST EMISSIONS OF INTERNAL COMBUSTION ENGINES

Jack C. Priegel, El Paso, Tex., assignor to Autotronic Controls Corporation, El Paso, Tex.

Continuation of Ser. No. 470,566, May 16, 1974, abandoned, which is a division of Ser. No. 122,933, March 10, 1971, Pat. No. 3,817,225. This application Sept. 17, 1976, Ser. No. 724,073

Int. Cl.[2] F02B *3/00*

U.S. Cl. 431—90 **13 Claims**

1. A method of controlling the air/fuel ratio in a combustion apparatus having a chamber into which flows of air and fuel are conducted so that the resulting mixture can be combusted to provide a source of energy, said method comprising the following steps:

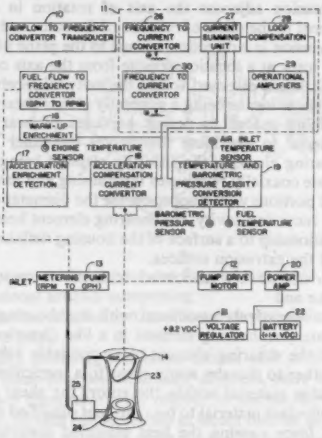
establishing a rate of air flow with valve means according to a desired output of the combustion apparatus;

measuring said air flow rate and producing a first signal systematically related to said air flow rate;

pumping fuel into said chamber with a positive displacement fuel pump driven by a motor;

measuring the speed of said fuel pump and producing a second signal systematically related to said speed;

providing a ratio control signal corresponding to a selected air/fuel ratio;



combining said first, second, and ratio control signals to produce a fuel feed control signal systematically related to the deviation of the ratio of said air and fuel flow rates from said selected air/fuel ratio; and

utilizing said fuel feed control signal to control the speed of said motor to supply fuel to said chamber at a rate minimizing said deviation, thereby providing a flow of fuel which results in the delivery of air and fuel to said chamber in said selected air/fuel ratio.

4,050,879

FUEL COMBUSTION APPARATUS

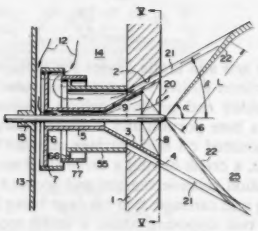
Yasuro Takahashi; Yukihisa Fujima; Masaharu Oguri, and Akito Komori, all of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 3, 1975, Ser. No. 628,427

Claims priority, application Japan, Nov. 18, 1974, 49-132501; Nov. 18, 1974, 49-138610

Int. Cl.[2] F23D *15/00*

U.S. Cl. 431—174 **5 Claims**



1. A fuel combustion apparatus for burning a premix of air and fuel, comprising a conical air nozzle positioned in spaced relation within a conical opening in a furnace wall to define an air passageway therebetween to form a conical film of air and fuel atomizing means for injecting fuel into the conical film of air in amounts varying circumferentially of said film of air so

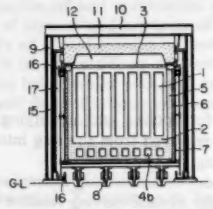
that a premix is formed uniformly mixed with air and having a varied air-fuel ratio which is greater than 1 and less than 1 at predetermined circumferential locations of said film of air.

4,050,880

METHOD AND APPARATUS OF BAKING CARBONACEOUS MOLDING

Kiyoshi Naito, Urawa, and Akio Shukuya, Kawagoe, both of Japan, assignors to Shinagawa Refractories Co. Ltd., Tokyo, Japan

Filed Mar. 18, 1976, Ser. No. 667,851
Claims priority, application Japan, Apr. 16, 1975, 50-45180
Int. Cl.[2] F27D *5/00*; F27B *9/00*
U.S. Cl. 432—5 15 Claims



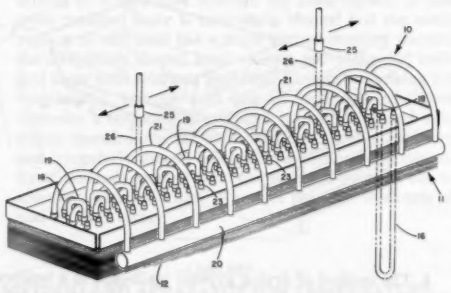
1. A method for the continuous baking of preheating, burning and cooling of carbonaceous moldings, which comprises charging, with carbonaceous moldings to be baked and breeze, a mobile baking chamber provided with a combustion chamber and a gas flue through which combustion gas, heating gas or cooling air passes, sealing from the atmospheric air the space between a fixed ceiling having a combustion means and a gas recirculation means and said mobile baking chamber, and the upper contact surface of intermobile baking chamber, and connecting a number of said mobile baking chamber in a row for movement beneath the fixed ceiling.

4,050,881

REMOTE HEATING PROCESS

James J. Watson, Jr., McMinnville, Tenn., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Mar. 31, 1976, Ser. No. 672,199
Int. Cl.[2] F27D *13/00*; F27B *3/22*
U.S. Cl. 432—5 8 Claims



1. In the fabrication of a heat exchanger wherein tubular components are bonded together to form flow circuits through the heat exchanger coil, the process of heating the tubular joints of the exchanger during the bonding operation, including the steps of

assembling the tubular components with their joints being located in a region adjacent to at least one tube sheet of the heat exchanger coil,

directing a high speed jet of flammable gas at the tube sheet adjacent to the joint region whereby, upon striking the tube sheet, the gas forms a blanket of flammable gas about the tubular joints,

maintaining the velocity of the jet traveling between the jet source and the tube sheet at a speed sufficiently high enough to prevent the gas in the jet stream from mixing with ambient air and thus being ignited, and

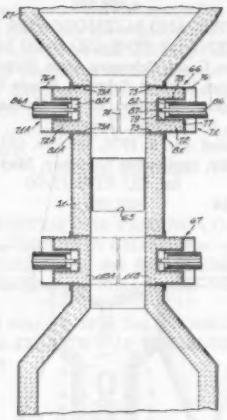
igniting the gas within the blanket to create a burning zone encompassing the tube joint region whereby the joints are heated to a predetermined temperature.

4,050,882

DUAL VARIABLE ORIFICE FOR REINFORCED PREHEATER

Robert F. Kohl, Tucson, Ariz.; Lyle A. Karis, West Allis, and James L. Shy, East Troy, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 4, 1976, Ser. No. 738,847
Int. Cl.[2] F27B *7/02*
U.S. Cl. 432—14 9 Claims



1. In a method of processing cement materials for making Portland cement in a system utilizing kiln and an associated cooler and having a flue connection to a suspension preheater provided with a calciner and a mixing chamber, wherein the material to be processed is suspended in a gas stream, comprising the steps of:

A. Regulating the amount of kiln off-gases that is permitted to pass into the mixing chamber;

B. Bypassing the kiln off-gases not passed to the mixing chamber through a bypass system;

C. Supplying gas from a source to replace a portion of the kiln off-gases not passed to the mixing chamber;

D. Regulating the flow of the gas supplied from the source and off-gases from the kiln and the flow area to the mixing chamber to control the flow velocity of the gases into the mixing chamber thereby preventing materials in the mixing chamber from short circuiting and preheater system by falling out into the kiln.

9. An apparatus for processing cement materials for making Portland cement which utilizes a kiln having an inlet end enclosed in a hood and an outlet end connected to an associated cooler and having a reinforced preheater system provided with a calciner and a mixing chamber which receives calcined material from the calciner to mix with gas supplied to the mixing chamber, the improvement including;

a gas flow flue connected between the kiln hood and the entrance to the mixing chamber;

a kiln off-gas bypass means connected into the kiln hood and operable to provide a bypass flow path for kiln off-gases;

a first selectively adjustable flue restricting means operably

disposed in said flue to restrict the flow of kiln off-gases into said flue;

a duct operatively connected between a source of recoup cool gas and said flue to direct recoup gas into said flue; and,

a second selectively adjustable flue restricting means operably disposed in said flue in a position above the entrance of said recoup cooler gas duct into said flue;

whereby the first adjustable flue restricting means may be selectively operated to restrict the flow of a predetermined amount of kiln off-gases into said flue thereby forcing the kiln off-gases to flow into the bypass path, and said recoup cooler gas branch duct operates to provide a volume of recoup gas to supplement the kiln gas that is bypassed, and the second adjustable restricting means is selectively operable to restrict the flue opening therethrough to effect an increase in the velocity of the gas flowing into the mixing chamber thereby preventing materials from falling out of the mixing chamber.

4,050,883

APPARATUS AND METHODS FOR THE HEAT TREATMENT OF FINE-GRAINED MATERIALS

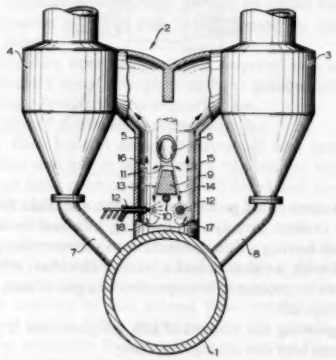
Wolf Goldmann; Georg Schepers; Otto Heinemann, all of Enigerloh; Heinz-Herbert Schmits, Rheda-Wiedenbruck, and Horst Ritzmann, Enniger, all of Germany, assignors to Polysius AG, Neubeckum, Germany

Filed Apr. 8, 1976, Ser. No. 674,951

Claims priority, application Germany, May 6, 1975, 2520102

Int. Cl.² F27B *15/00*

U.S. Cl. 432—14 **13 Claims**



1. In apparatus for the heat treatment of fine-grained material prior to firing said material in a furnace and wherein said apparatus includes a gas conduit having a substantially vertical portion, inlet means for introducing a fine-grained material to said conduit at a first level such that said material may fall downwardly through said vertical portion, means for combusting fuel in said conduit at a second level lower than said first level to provide at said second level a heating zone through which said material may fall, means in said conduit between said first and second levels for distributing said material over the cross-sectional area of said conduit as it falls downwardly, and means for delivering furnace exhaust gas to said conduit at a level below said heating zone and at such velocity with respect to the grain size of said material that at least part of the material which falls through said heating zone is entrained by said gas and passed again through said heating zone; the improvement comprising means adjustably mounting said distributing means for movement within said conduit between a plurality of positions, adjustment of said distributing means enabling the concentration of material in different cross-sectional areas of said conduit below said distributing means to be varied.

4,050,884

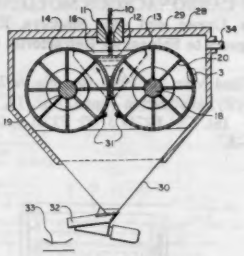
SLAG WASTE HEAT BOILER

Richard Jablin, 1438 Manor Lane, Blue Bell, Pa. 19422

Filed Mar. 4, 1976, Ser. No. 663,844

Int. Cl.² F24H *1/00*; F27B *17/00*

U.S. Cl. 432—29 **18 Claims**



1. A process for cooling and solidifying molten slag and converting heat removed from the slag into a useful form of energy comprising:

a. forming a pool of molten slag maintained in contact with a heat-transfer surface moving relative to said pool;

b. pouring fresh molten slag into said pool of molten slag;

c. cooling and solidifying slag from said pool on said heat-transfer surface while transferring heat from said cooled and solidified slag to said heat-transfer surface;

d. scraping said solidified slag from said heat transfer surface; and

e. absorbing said heat from said heat-transfer surface into a heat absorber for making further use of said heat.

4,050,885

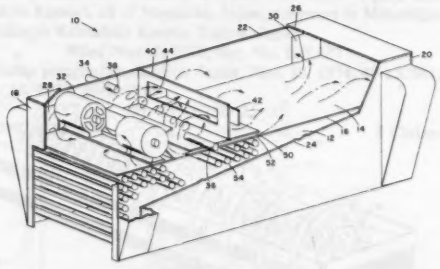
METHOD OF DRYING GYPSUM WALLBOARD AND APPARATUS THEREFOR

Chester R. Nowick, Williamsville, and Alfred DeFranza, Buffalo, both of N.Y., assignors to National Gypsum Company, Buffalo, N.Y.

Filed Mar. 18, 1976, Ser. No. 668,085

Int. Cl.² F26D *7/04*; F27B *9/00*

U.S. Cl. 432—31 **10 Claims**



1. The method of drying gypsum wallboard in a wallboard dryer having

1. a drying section with means for conveying wallboard therethrough at a plurality of spaced apart levels, and

2. an elongate gas reheating plenum section having elongate exterior walls separating the interior of said plenum from the exterior thereof, having means for moving gases from said dryer section into and on through said plenum and back to said dryer section, and having combustion means in said walls for propelling heated products of combustion, said method comprising the steps of

a. continuously conveying a plurality of undried gypsum

wallboards into and through said drying section at said plurality of levels,

b. drying said wallboards at an equal rate at all said levels by passing heated gases through said drying section, which said gases are at a uniform temperature throughout as said gases enter said drying section,

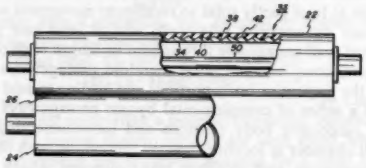
c. providing said uniform temperature heated gases by moving gases from said dryer section through said means for moving gases and from said moving means on through said plenum whereat said means for propelling heated products of combustion directs heated products of combustion crosswise of said plenum at an angle of from about 45° to about 135° to the direction of flow of said gases from said moving means, and mixing said heated products of combustion thoroughly with substantially all of said gases by the turbulence caused by the combination of said combustion and said crossed directions of flow of said products of combustion and substantially all of said gases to be heated, lowering the temperature of said products of combustion to about 550° F upon being mixed with said gases which intersect with said flow of products of combustion.

4,050,886

ROLL FUSER

Rabin Moser, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 24, 1976, Ser. No. 726,328
Int. Cl.² F27B *9/28*; B60B *5/00*
U.S. Cl. 432—60 **7 Claims**



1. In a fuser apparatus for fixing toner images to copy substrates including a heated roll structure and a backup roll structure forming a nip through which said substrates move with said toner images contacting said heated roll structure, the improvement comprising:

one of said roll structures having an outer resilient layer affixed to a rigid core wherein the inner surface of said outer resilient layer is irregularly shaped and the outer surface of said core has a shape complementary thereto, the irregularly shaped inner surface providing said resilient layer with alternate thick and thin portions along the longitudinal axis of said one of said roll structures whereby a structure is provided which strips said substrates therefrom as the substrates pass through said nip; said irregularly shaped inner surface comprising a plurality of similarly shaped areas the distance between corresponding parts of which is greater than the thickness of said resilient layer.

4,050,887

METHOD AND APPARATUS FOR TEMPERATURE CONDITIONING PARTS

L. John Berggren, Simsbury; Charles L. D. Chin, Avon, and Joseph R. Reilly, Naugatuck, all of Conn., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 418,075, Nov. 21, 1973, Pat. No. 3,894,835.
This application Nov. 4, 1974, Ser. No. 520,620
Int. Cl.² F27B *9/14*; F02M *17/28*
U.S. Cl. 432—122 **20 Claims**

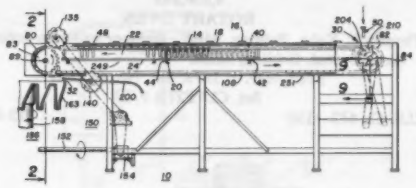
1. A process for temperature-conditioning elongated molded parts which comprises:

a. loading a plurality of said parts in side-by-side relationship into consecutively presented part-supporting assemblies at a charging station;

b. passing the parts while supported in the assemblies in one direction along a series of generally parallel paths between adjacent heat transfer assemblies;

c. rotating the parts about their vertical axes during movement along said paths;

d. transferring heat between said parts and heat transfer assemblies as the parts traverse said paths;



e. discharging said parts from said assemblies after traversing said paths without any blow molding of said parts after heat transfer and before said discharge; and

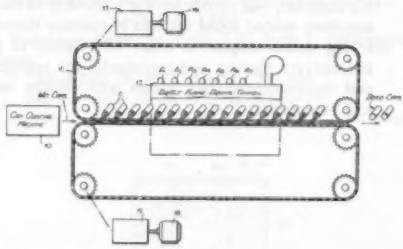
f. recylcing said assemblies after discharge of said parts in the opposite direction substantially parallel to said one direction back to the charging station without passage through an intermediate processing station to receive additional parts.

4,050,888

CONVEYOR SYSTEM FOR PASSING COATED CANS THROUGH CHAMBER

Lewis Pfister, White Plains, and Edward Ehas, Floral Park, both of N.Y., assignors to Flynn Burner Corporation, New York, N.Y.

Filed Mar. 19, 1976, Ser. No. 668,510
Int. Cl.² F27B *9/14*; F26B *25/02*
U.S. Cl. 432—124 **3 Claims**



1. A conveyor system for conducting objects which are cans having a fresh coating thereon through a chamber for treating said can coatings and for concurrently rotating these objects to optimize said treatment, said system comprising:

A. an endless belt for conducting said objects through said chamber and having rotatable pins mounted thereon, the pins extending laterally from the belt, one end of the pins having means thereon for supporting said objects, the other end of each pin having a sprocket wheel secured thereto;

B. an endless sprocket chain disposed in parallel relation to said belt, said chain being engaged by the sprocket wheels mounted on said pins;

C. first variable speed drive means operatively coupled to said belt to cause movement thereof in a predetermined direction to advance said objects through said chamber at a desired speed; and

D. second variable speed drive means independent of said

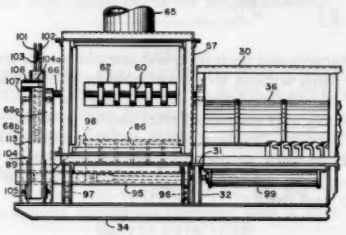
first means and operatively coupled to said chain to cause movement thereof in a selectable direction to cause the pin-borne objects to rotate at a rate determined by the relative speeds of said belt and said chain and in a direction determined by the selected direction.

4,050,889

ROTARY OVEN

Thomas F. Kohn, Belding, Mich., assignor to Belco Industries, Incorporated, Belding, Mich.

Filed Mar. 1, 1976, Ser. No. 662,822
Int. Cl.² F27B 9/02
U.S. Cl. 432—130 **13 Claims**



1. An oven having a primary heating chamber including heat-generating means and means for inducing movement of gases through said primary heating chamber, means for inducing movement of objects along a path through said primary heating chamber, and a secondary heating chamber communicating with said primary heating chamber and traversed by said path and by said gases, wherein the improvement comprises:

an object carrier rotatably mounted in said secondary heating chamber, said carrier having a plurality of receptacles angularly spaced about the axis of rotation thereof; and

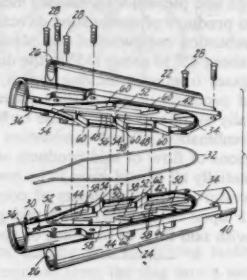
indexing means adapted to rotate said carrier to positions successively placing said receptacles for engagement of said movement-inducing means with objects carried by said receptacles.

4,050,890

HOT MELT DISPENSER BODY

Richard Montgomery Elliott, and Albert Eugene Newton, both of Beverly, Mass., assignors to USM Corporation, Boston, Mass.

Filed Apr. 12, 1976, Ser. No. 676,220
Int. Cl.² F27B 5/00, 17/00
U.S. Cl. 432—210 **7 Claims**



1. A hot melt body for an applicator of thermoplastic material to be advanced from an inlet to an outlet end and progressively reduced from solid to fluid as the material is thus fed, the body comprising elongated complemental portions defining a longitudinal main melt chamber extending between the inlet and outlet end and having progressively diminishing cross sections toward the outlet end shaped to constrain the material while at least partly solid to rectilinear movement and characterized by opposite side walls and at least one continuous flatted wall engageable throughout its length with the thermoplastic, complemental outer manifold passageways formed in the the respective body portions and leading to said outlet end, and a series of complemental bypass passageways formed in the respective body portions and interconnecting the main melt chamber at localities spaced therealong with the manifold passageways, said localities being disposed where solid thermoplastic material in said chamber is being rendered molten and semi-fluid, means in the body coextensive with said passageways for heating the walls of the main melt chamber and of the manifold and bypass passageways, said bypass passageways being generally angularly biased divergently relative to the side walls of said chamber in the direction of the feeding of said material in the main melt chamber.

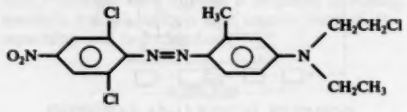
4,050,891

HEAT TRANSFER BLACK DYESTUFF A

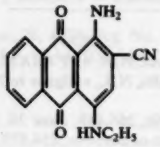
Jacques R. Magill, Milton, N.J., assignor to Crompton & Knowles Corporation, New York, N.Y.

Filed Dec. 17, 1976, Ser. No. 751,748
Int. Cl.[2] D06P *1/20;* C09D *11/00*
U.S. Cl. 8—2.5 R 19 Claims

1. A dyestuff composition composed of 20 to 80 parts of a brown dye of the formula



and 80 to 20 parts of a blue dye of the formula



4,050,892

COLORING POLYESTER MATERIALS WITH ACID DYES

Dara Ardeshir Jilla, Collinsville, Va., assignor to Martin Processing Co., Inc., Martinsville, Va.

Filed Sept. 13, 1973, Ser. No. 396,805
Int. Cl.[2] D06P *3/00*
U.S. Cl. 8—4 14 Claims

1. A process for pretreating a material consisting essentially of polyester to impart thereto affinity for acid dyes, which comprises pretreating the polyester material for a brief time less than about one minute at a temperature between 90° C and 250° C and at ordinary atmospheric pressure with a mixture of (a) an organic nitrogen compound selected from the group consisting of diethylenetriamine, triethylenetetramine, tetraethylenepentamine, hexamethylenediamine, hexamethylenetetramine, mono-, di- and triethanolamine, triethylamine, di- and tripropylamine, and di- and tributylamine, and (b) a glycol selected from the group consisting of ethylene glycol, di-, tri- and tetraethylene glycol, and polypropylene glycol, and then subjecting the polyester material to contact with cold water or a mixture of cold water and a carboxylic acid selected from the group consisting of oxalic acid, sebacic acid, citric acid, and adipic acid sufficient to chill the polyester material, thereby imparting to the thus-pretreated polyester material an affinity for acid dyes.

4,050,893

ARRANGEMENT FOR PREPARING NATURAL TISSUE FOR IMPLANTATION

Warren D. Hancock, Santa Ana, and Frederick P. Sattler, Fullerton, both of Calif., assignors to Hancock Laboratories, Inc., Anaheim, Calif.

Continuation of Ser. No. 490,686, July 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 324,217, Jan. 16, 1973, abandoned, which is a continuation of Ser. No. 28,630, April 15, 1970, abandoned. This application Mar. 10, 1976, Ser. No. 665,520
Int. Cl.[2] C14C *3/16;* A61F *1/22*
U.S. Cl. 8—94.11 46 Claims

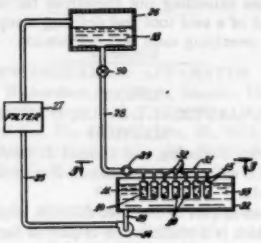
1. The method of preparing natural heart valve for implantation comprising the steps of

applying a tanning fluid under pressure in the physiologic range to the downstream end of a natural heart valve so as to cause said valve to assume substantially its natural configuration,

and simultaneously applying a tanning fluid to the upstream end of said valve at a pressure less than that at said downstream end,

thereby to cause said valve substantially to maintain said configuration during fixation of the tissue thereof.

10. The method of preparing for implantation natural tissues in a form in which a portion thereof is subjected to pressure within the physiologic range when implanted and which assumes a predetermined configuration as a result of such pressure comprising the steps of



applying a tanning fluid to said portion of said tissues,

said tanning fluid so applied being under pressure in the physiologic range so as to cause said tissues to assume substantially said predetermined configuration,

and simultaneously applying a tanning fluid to remaining parts of said tissues at a pressure less than that of said portion of said tissues,

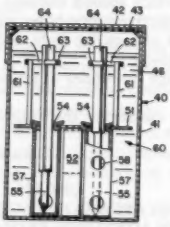
thereby to cause said tissues to assume said configuration during fixation of said tissues.

4,050,894

STERILIZING AND STERILITY MAINTAINING APPARATUS FOR DENTAL AND SURGICAL TOOLS AND THE LIKE

Mariano Rodriguez Genis, 7a. Calle 3-37 Zona 1, Guatemala, Guatemala

Filed Feb. 25, 1975, Ser. No. 552,955
Int. Cl.[2] A61L *3/00, 3/02;* B65D *81/24*
U.S. Cl. 21—86 6 Claims



1. Sterilizing and sterility-maintaining apparatus for dental and surgical tools and the like, including in combination

a main sterilizing container having a cover, heating means, and capsule-supporting means,

a plurality of imperforate tool-holding capsules removably mounted in capsule-supporting means, said capsules having removably and hermetically sealable closures, and

a normally solid petroleum product that is liquid at sterilizing temperatures, retained in each said capsule and surrounding and covering at least the operative portions of the tools in said capsules and serving in solidified state to

aid in retaining the sterility of each said tool after completion of the sterilization and after said capsule is opened,

at least one of said capsules including tool support means therewithin, each said tool support means comprising

a disc covered by said petroleum product and having a perforation therethrough for each tool to be supported,

a perforate tube for housing each said tool, attached to said disc below each said perforation through said disc,

retention means secured to said disc for holding said disc relative to said capsule, and

upstanding post means secured to said disc and having support means extending out therefrom for supporting the upper end of a said tool and defining a support ring-like structure overlying each said perforation.

4,050,895

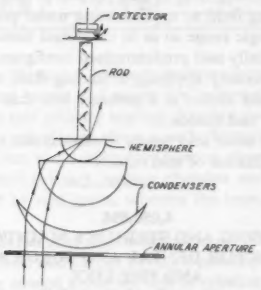
OPTICAL ANALYTICAL DEVICE, WAVEGUIDE AND METHOD

Edgar E. Hardy, Kettering, and Donald J. David, Centerville, both of Ohio, assignors to Monsanto Research Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 617,120, Sept. 26, 1975, abandoned, which is a continuation-in-part of Ser. No. 522,558, Nov. 11, 1974, abandoned. This application Sept. 17, 1976, Ser. No. 724,035

Int. Cl.[2] G01N *21/22, 33/16*

U.S. Cl. 23—230 R **34 Claims**



1. A device for detecting a first material comprising

a. an elongated waveguide having on a longitudinal peripheral surface of said waveguide a second material providing for multiple internal reflections of light through said material, which second material on contacting said first material selectively combines with said first material to measurably change the light transmitting capabilities of said waveguide,

b. a light source positioned to transmit light into said waveguide, and

c. means for measuring the light exiting from said waveguide.

4,050,896

METHOD AND APPARATUS FOR THE PRODUCTION OF REACTION MIXTURES FROM LIQUID REACTION COMPONENTS

Reiner Raffel, Siegburg; Wilfried Ebeling, Cologne; Klaus Nadolski, and Klaus Schulte, both of Leverkusen, all of Germany, assignors to Maschinenfabrik Hennecke GmbH and Bayer Aktiengesellschaft, both of Leverkusen, Germany

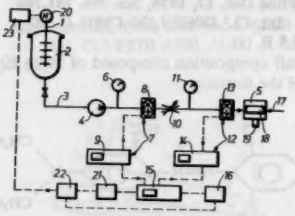
Filed Sept. 13, 1976, Ser. No. 722,900

Claims priority, application Germany, Sept. 27, 1975, 2543302

Int. Cl.[2] G01F *1/86, 1/88;* G01N *9/26*

U.S. Cl. 23—230 A **12 Claims**

1. A method for the production of reaction mixtures from two or more liquid reaction components comprising charging at least one of the reaction components with a gas, measuring the volumetric flowrate of the gas-charged reaction component at a first pressure level, bringing the gas charged reaction component to a second pressure level, measuring the volumetric flowrate at said second pressure level whereby the differential value of the measured volumetric flowrate is a measurement for the gas charge and mixing the gas charged component with the remaining reaction components.



4,050,897

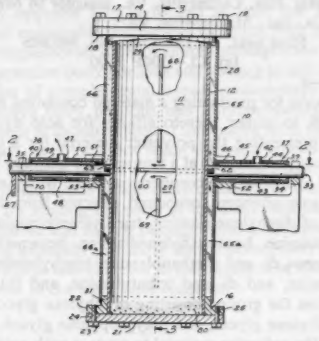
REACTOR APPARATUS

Max Klein, Tinton Falls, N.J., assignor to Normac, Inc., Tinton Falls, N.J.

Division of Ser. No. 266,469, June 26, 1972, which is a continuation-in-part of Ser. No. 814,879, March 19, 1969, abandoned, which is a continuation-in-part of Ser. No. 601,148, Dec. 12, 1966, abandoned, which is a continuation-in-part of Ser. No. 460,187, June 1, 1965, abandoned. This application July 27, 1976, Ser. No. 709,249

Int. Cl.[2] B01J *1/00;* B08B *13/00;* C08F *2/00*

U.S. Cl. 23—252 R **13 Claims**



1. An apparatus effective for treating materials under selected temperature conditions and with agitation, which comprises:

a. a liquid-tightly closeable tubular materials-treating chamber,

b. a temperature-control fluid jacket spaced away from and enclosing at least substantially its overall body portion thereby to provide a temperature-control fluid chamber enclosing said body portion,

c. divider means within said control fluid chamber and extending in at least substantially liquid-tight engagement with its wall and that of said treating chamber and dividing said control fluid chamber into a plurality of substantially equal control fluid compartments, said divider means comprising an annular divider member in like liquid-tight engagement and lying in a plane substantially normally transverse to the central axis of said chamber;

d. means to enable rotating the tubular jacketed treating chamber end over end about an axis lying substantially in said plane and also substantially normally transverse to said central axis;

e. temperature-control fluid ingress means to enable feeding

said fluid to about the correspondingly same inlet location of each said compartment and while the treating chamber is being thus rotated;

f. control fluid egress means at about the correspondingly same outlet location of each said compartment to enable discharging heat-control fluid from said compartments while said chamber is being rotated; and

g. flowing fluid diverter means in each said compartment intermediate its fluid ingress and egress ends to affect the flow course of fluids through it to enable providing substantially overall uniform heat transfer through the wall separating said two chambers.

4,050,898

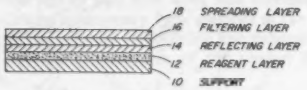
INTEGRAL ANALYTICAL ELEMENT

Charles A. Goffe, deceased, late of Brockport, N.Y., by Patricia A. Goffe, executrix; Royden N. Rand, and Tai W. Wu, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 26, 1976, Ser. No. 680,619

Int. Cl.² G01N *31/22*

U.S. Cl. 23—253 TP **23 Claims**



1. An element for detection of analyte dissolved in proteinaceous, aqueous liquids, the element comprising an isotropically porous spreading layer and a reagent layer, wherein the spreading layer comprises a non-fibrous, water-resistant material and an non-ionic surfactant, the surfactant being present in an amount within the range of from about 1 to about 15 percent and effective to normalize liquid transport in the spreading layer.

4,050,899

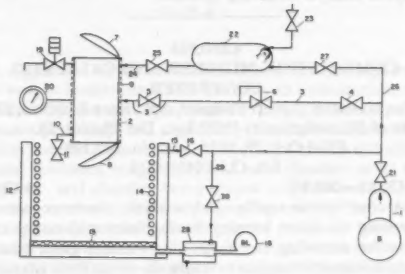
METHOD AND APPARATUS FOR FRAGMENTING CERTAIN SOLID WASTES

Kenneth E. Grube, 150 Anchorage Circle; Vincent E. Harrington, and James V. Harrington, both of 19 Dolphin Road, all of Groton, Conn. 06340

Continuation-in-part of Ser. No. 429,733, Jan. 2, 1974, abandoned. This application Oct. 6, 1975, Ser. No. 620,068

Int. Cl.² C05F *9/02*

U.S. Cl. 23—259.1 **4 Claims**



1. Apparatus for processing waste material of the type collected from municipalities to facilitate decomposition of organic components thereof, comprising:

a pressure vessel;

means for hydrating the waste material within the pressure vessel under pressure at tempertures sufficient to boil the moisture at atmospheric pressure;

means for dehydrating, comminuting and expelling the waste material by sudden decompression of the vessel; and

an open ended composting pit underlying the pressure vessel and receiving the comminuted dehydrated material expelled from the pressure vessel, the open ended composting pit having a pair of concentric spaced apart wall members surrounding the material, and a heating coil in the space between said wall members for regulating the temperature of the interior of the pit, thereby controlling the action of aerobic decomposition of the material therein.

4,050,900

INCINERATION APPARATUS

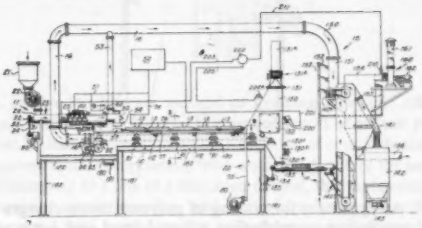
Jim F. Hobbs, Richardson, and Craig Smyser, Dallas, both of Tex., assignors to Shirco, Ltd., Dallas, Tex.

Continuation of Ser. No. 423,398, Dec. 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 38,936, May 20, 1970, Pat. No. 3,648,630. This application Oct. 31, 1975, Ser. No. 627,651

The portion of the term of this patent subsequent to Mar. 13, 1989, has been disclaimed.

Int. Cl.² F23G *5/10*

U.S. Cl. 23—277 R **7 Claims**



1. An incinerator for processing materials having volatile components comprising:

a housing defining an elongated combustion chamber having an inlet end and a discharge end;

a conveyor belt supported on rollers for movement in said combustion chamber and having an upper belt portion for moving materials being processed in said incinerator along said combustion chamber from said inlet end to said discharge end and further having a return belt portion below said upper belt portion;

infrared heat means supported on said housing and adapted to direct infrared rays on said materials on said conveyor belt as said belt moves said materials along said combustion chamber, said materials releasing combustion gases as a result of heating from said infrared rays;

charging means connected with said housing at said inlet end of said combustion chamber for receiving materials from a source and discharging said materials on said conveyor belt in said chamber;

means for removing processed materials from said combustion chamber at the discharge end of said chamber;

means connected to said housing for forcing ambient air into said housing in the region of said discharge end;

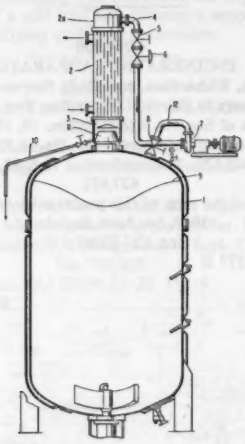
means for inducing a draft at said inlet end in order to create a backflowing mixture of air and combustion gases, said backflowing mixture flowing over and generally parallel to said materials from the region of said discharge end to said inlet end in order to provide a portion of the heat required for drying and combustion of said material; and

heat sensing means located within said housing above said conveyor belt and connected to control means for varying the temperature of said backflowing mixture by controlling the intensity of said heat means.

4,050,901
COOLING UNIT FOR LARGE POLYMERIZATION VESSELS

Kurt Pfeiffer; Johannes Dietrich; Günter Beckmann, and Karl-Heinz Herkt, all of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Germany

Division of Ser. No. 167,568, July 3, 1971, Pat. No. 3,785,430.
This application June 4, 1973, Ser. No. 366,520
Claims priority, application Germany, Aug. 1, 1970, 2038363
Int. Cl.[2] B01J *1/00*
U.S. Cl. 23—285 9 Claims



1. An apparatus for cooling of polymerization charges in a polymerization vessel having a liquid level and a gas space above said liquid level, comprising a reflux cooler means including a reflux cooler head mounted on the polymerization vessel above said liquid level and in direct open communication with the gas space of the polymerization vessel, a gas conduit means operatively connecting the reflux cooler head with the polymerization vessel and being in communication with the gas space of the polymerization vessel, and means in said gas conduit means for providing a force-feeding of the gas through said gas conduit means, said reflux cooler means and said gas space.

4,050,902
SPENT CATALYST REGENERATION WITH INTERNAL AND EXTERNAL REGENERATED-CATALYST RECYCLE MEANS

Richard P. Pulak, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 533,052, Dec. 16, 1974, which is a continuation-in-part of Ser. No. 429,422, Dec. 28, 1973, Pat. No. 3,953,175. This application Nov. 1, 1976, Ser. No. 737,357
The portion of the term of this patent subsequent to Apr. 27, 1993, has been disclaimed.
Int. Cl.[2] B01J *8/08, 8/18, 37/14*
U.S. Cl. 23—288 B 5 Claims

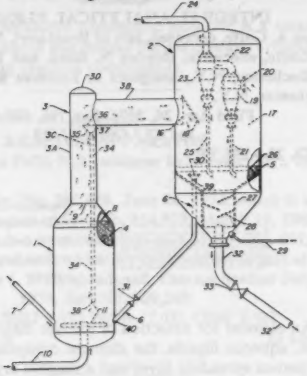
1. An apparatus for oxidizing coke on spent catalyst which comprises in combination:

a. a spent-catalyst receiving chamber for containing a dense-phase fluidized bed of catalyst having a spent-catalyst inlet means and a fresh-regeneration-gas inlet means connected thereto to allow passage of spent catalyst and fresh regeneration gas respectively into said chamber and having a regenerated-catalyst/regeneration-gas outlet means connected thereto to allow passage of regenerated catalyst and regeneration gas from said chamber;

b. a transfer conduit having a substantially vertical portion and a substantially horizontal portion, said vertical portion having an inlet connected to the regenerated-catalyst/regeneration-gas outlet means and said horizontal portion extending into the side of a hereinafter described regenerated-catalyst receiving chamber and having an outlet within said chamber whereby regenerated catalyst and regeneration gas are carried from said spent-catalyst receiving chamber in admixture to said regenerated-catalyst receiving chamber;

c. an internal regenerated-catalyst recycle means, having an inlet means in the transfer conduit and an outlet means in the spent-catalyst receiving chamber, to allow passage of a portion of regenerated catalyst from the transfer conduit to the spent-catalyst receiving chamber;

d. a regenerated-catalyst receiving chamber for containing a dense-phase bed of regenerated catalyst, said chamber



having a regenerated-catalyst outlet means and a spent-regeneration-gas outlet means connected thereto to allow passage of regenerated catalyst and spent regeneration gas from said chamber and said chamber being positioned adjacent to and at an elevation with respect to said spent-catalyst receiving chamber to maintain at least a portion of said dense-phase bed of regenerated catalyst above said dense-phase fluidized bed of catalyst in said spent-catalyst receiving chamber; and,

e. an external regenerated-catalyst recycle means, having an inlet means in the regenerated-catalyst receiving chamber and an outlet means in the spent-catalyst receiving chamber, to allow passage of a portion of regenerated catalyst from the regenerated-catalyst receiving chamber to the spent-catalyst receiving chamber.

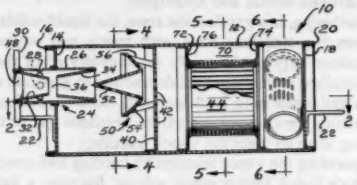
4,050,903
COMBINATION MUFFLER AND CATALYTIC CONVERTER

Charles H. Bailey, Mount Prospect, and James E. Dillon, Elgin, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Oct. 29, 1976, Ser. No. 737,129
Int. Cl.[2] F01N *3/15*
U.S. Cl. 23—288 FC 4 Claims

1. A combination muffler and catalytic converter assembly comprising an outer housing having inlet and outlet tubes therein for receiving and exhausting exhaust gases from an internal combustion engine to which the assembly is adapted to be attached; an axial flow monolithic catalytic converter element positioned within said housing and radially spaced from the walls thereof in the path of said exhaust gases; aspirator means including a plurality of openings and a venturi portion in said inlet tube for sucking secondary air through said plurality of openings and into an exhaust gas stream passing through said venturi portion of said inlet tube; a perforated distributor plate having a plurality of spaced openings defining an open area equal to 20 – 40% of the open face inlet area of the cata-

lytic converter element, said distributor plate being positioned in said housing intermediate said aspirator means and said catalytic converter element, said perforated distributor plate containing at least 5 openings per square inch and being spaced upstream from the inlet end of said monolithic catalytic converter element by at least about 5.5 times the diameter of the openings in the distributor plate, the openings in said perforated distributor plate defining a pattern whose outer periphery generally corresponds to the outer periphery of the open inlet face area of the catalytic converter element, and turbulence inducing means positioned between said distributor plate and the inlet end of said inlet tube, said turbulence inducing means including a stationary vane member in the exhaust inlet upstream of the venturi for swirling the exhaust gases and a deflector member downstream of the venturi for reversing their flow.



4,050,904

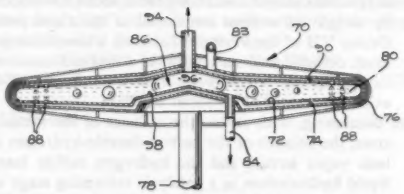
SOLUBILIZATION AND REACTION OF COAL AND LIKE CARBONACEOUS FEEDSTOCKS TO HYDROCARBONS AND APPARATUS THEREFOR

Frank B. Cramer, Mission Hills, Calif., assignor to Clean Energy Corporation, Los Angeles, Calif.

Division of Ser. No. 512,538, Oct. 7, 1974, Pat. No. 3,966,582. This application Dec. 29, 1975, Ser. No. 644,953

Int. Cl.² B01J *1/00*

U.S. Cl. 23—288 E **4 Claims**



1. Apparatus for the conversion of coal and like high molecular weight feedstocks at least partially to hydrocarbon vapor which comprises a reaction chamber having a central portion, an outer periphery, and a generally circular horizontal cross-section therebetween, means introducing a molten salt solution of said feedstock tangentially into said chamber at its outer periphery, said chamber being shaped to guide said feedstock solution circularly then inwardly progressively as a spirally moving mass from said chamber outer periphery toward the chamber central portion, a circularly distributed series of jet means outward of the chamber central portion, said jet means mixing steam continually distributively into fresh portions of said salt solution to form said moving mass of feedstock solution in molten salt into a reaction stream and under hydrogenating conditions within the chamber, whereby hydrocarbon vapors are evolved in the reaction stream in spirally moving reaction stream-entrained relation, vapor recovery means recovering evolved hydrocarbon vapors from said molten salt comprisng a central domed portion in the reactor and a vapor outlet in said portion at a relative pressure to radially inwardly bias movement of said evolved hydrocarbon vapor toward said outlet through the spirally moving reaction stream, and molten salt recovery means including a reaction chamber salt outlet in the chamber central portion.

4,050,905

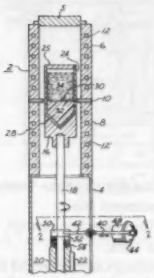
GROWTH OF DOPED CRYSTALS

Carl F. Swinehart, University Heights, Ohio, assignor to The Harshaw Chemical Company, Cleveland, Ohio

Filed May 27, 1975, Ser. No. 581,233

Int. Cl.² B01D *9/00;* **B01J** *17/08, 17/36;* **C01D** *3/00*

U.S. Cl. 23—301 **6 Claims**



1. In the Stockbarger method of growing inorganic alkali metal or alkaline earth metal salt crystal ingots of at least two inches in diameter and containing a plurality of crystal domains or macrocrystal components, from a stratified melt of the same containing up to 1.5% of a dissolved dopant, the improvement comprising slowly moving, with variable velocity, the solidified crystal with respect to the melt about a vertical axis at a rate that is adequate to maintain an even distribution of the dopant in the melt at the interface, but that is not sufficient to disturb the temperature gradient in the melt.

4,050,906

THERMOSTATIC METAL

Jacob L. Ornstein, Norton, and Seth R. Thomas, Middleboro, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 30, 1968, Ser. No. 771,824

Int. Cl. B22b *15/00*

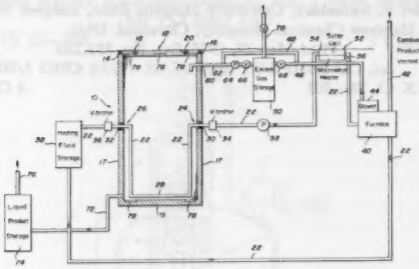
U.S. Cl. 428—617 **1 Claim**

1. A multilayer composite thermostatic metal material comprising a first metal layer composed of an alloy consisting of approximately 72% manganese, 18% copper and 10% nickel, a second layer of metal selected from the group consisting of an alloy composed of approximately 36% nickel and 64% iron, an alloy composed of approximately 42% nickel and the balance iron, and an alloy composed of from 0.9 to 1.4% silicon, a maximum of 0.2% iron, from 0.1 to 2.5% manganese, a maximum of 0.05% lead, a maximum of 0.5% impurities, and the balance copper, a third layer of metal of relatively higher electrical conductivity than said metals of said first and second layers, said first and second metal layers being metallurgically bonded in the solid-phase to opposite sides of said third metal layer and having relatively high and low coefficients of thermal expansion respectively for cooperating with said third metal layer in substantially determining the electrical conductivity and flexivity characteristics of said thermostatic material, and an additional layer of metal selected from the group consisting of copper, nickel and cupronickle alloys having one face thereof metallurgically bonded in the solid-phase to one face of said first metal layer oppositely of said third metal layer protecting said first metal layer from oxidation and corrosion.

4,050,907
ORGANIC WASTE TREATING AND CONVERSION SYSTEM

George H. Brimhall, 435 Mirada Road, Half Moon Bay, Calif. 94109

Filed July 9, 1976, Ser. No. 703,771
Int. Cl.[2] C10J 3/00
U.S. Cl. 48—111 33 Claims



1. An apparatus for organic waste treatment comprising:
a. a waste treatment tank,
b. a heating fluid conduit circuit, a portion of which passes through the tank,
c. vibratory means connected to the conduit circuit adjacent the portion of the conduit circuit which passes through the tank for vibrating the portion of the conduit circuit which passes through the tank,
d. a pump positioned in the conduit circuit for circulating the heating fluid in the conduit circuit,
e. a furnace positioned in the portion of the conduit circuit which is external to the tank for heating the heating fluid in the conduit circuit,
f. feeding means interconnecting the tank and the furnace for feeding the gas generated in the tank to the furnace for combustion, and
g. supplemental heating means positioned in the portion of the conduit circuit which is external to the tank for supplementing the heat output of the furnace.

33. An apparatus for organic waste treatment comprising:
a. a vertical well for the waste to be treated having a depth substantially greater than its cross-sectional area,
b. a wire loop, a portion of which passes through the well,
c. vibratory means connected to the loop adjacent the portion of the loop which passes through the well,
d. gas recovery means connected to the well for recovering the gas generated in the well, and
e. radiation diffusers positioned in the top of the well.

4,050,908
PROCESS FOR THE PRODUCTION OF FUEL VALUES FROM COAL

Gerald P. McNamee, Santa Ana; Theodore R. Roszkowski, Malibu; David W. Stanbridge, Pacific Palisades, and Gerald A. White, Los Angeles, all of Calif., assignors to The Ralph M. Parsons Company, Pasadena, Calif.

Filed July 20, 1976, Ser. No. 707,004
Int. Cl.[2] C10J 3/16; C10K 3/04
U.S. Cl. 48—210 23 Claims

1. A process for the production of methane which comprises in combination the steps of:
a. forming a slurry of particulate coal in a liquid hydrocarbon solvent comprising hydrocarbons boiling up to about 750° F and generated from the liquefaction of coal in the presence of hydrogen;
b. combining the slurry and a hydrogen containing gas in a liquefaction zone maintained at a temperature from about 700° to about 1000° F and at a pressure up to about 2500 psi for a time sufficient to convert a substantial portion of coal to fluid hydrocarbons and a solid residue of liquefaction;
c. combining the effluent, fluid hydrocarbons and the solid residue of liquefaction from the liquefaction zone with a synthesis gas in a stripping zone and forming a liquid-solids fraction comprising liquid hydrocarbons boiling above the boiling point of the liquid hydrocarbon solvent and the solid residue of liquefaction and a vapor fraction comprising hydrocarbons, carbon monoxide, carbon dioxide, hydrogen sulfide and hydrogen;
d. combining, in a gasification zone, the liquid-solids fraction from the stripping zone with steam and oxygen in an amount sufficient to gasify substantially all of the carbon contained in the liquid-solids fraction to generate a synthesis gas comprising hydrogen and the oxides of carbon;
e. passing a major portion of the synthesis gas to the stripping zone to form the vapor fraction;
f. separating the vapor fraction by cooling and condensation into a liquid hydrocarbon solvent fraction, a light liquid hydrocarbon fraction and a residual vapor fraction comprising hydrocarbons containing up to about 5 carbon atoms, hydrogen sulfide, carbon dioxide, carbon monoxide and hydrogen;
g. returning at least a portion of the liquid hydrocarbon solvent fraction to form additional slurry;
h. converting a minor portion of the synthesis gas from the gasification zone into a hydrogen rich gas stream;
i. hydrotreating the light liquid hydrocarbon fraction with at least a portion of the hydrogen rich gas stream to convert bound sulfur to hydrogen sulfide and separating the formed hydrogen sulfide from the hydrogen sulfide lean light liquid hydrocarbon;
j. passing another portion of the hydrogen rich gas stream as at least part of the hydrogen containing gas to the liquefaction zone;
k. separating at least a portion of the contained carbon dioxide and hydrogen sulfide from the residual vapor fraction to form a carbon dioxide-hydrogen sulfide lean vapor stream;
l. methanating a portion of the carbon dioxide-hydrogen sulfide lean vapor stream in the presence of steam and a supported catalyst containing from about 5 to about 35% by weight of at least one metal of the third period of Group VII of the Periodic Table on a temperature stabilized, ceramic alumina support in a first methanation zone having an inlet temperature of at least about 900° F and exit temperature up to about 1500° F;
m. combining, with steam, the effluent of the methanation zone, the balance of the carbon dioxide-hydrogen sulfide lean vapor stream and the hydrogen sulfide lean light liquid hydrocarbon in a catalytic reforming stage where, at a temperature from about 1200° to about 1500° F maintained by the effluent of the methanation stage, hydrocarbons are reformed to yield an effluent gas stream comprising steam, hydrogen, carbon monoxide, carbon dioxide and methane; and
n. passing the effluent gas stream from the reforming stage to at least one additional methanation stage where the hydrogen and carbon monoxide react to form additional methane.

4,050,909
PROCESS AND APPARATUS FOR THE PRODUCTION OF HYDROGEN AND CARBON DIOXIDE

Gerhard Ranke, Poecking, Germany, assignor to Linde Aktiengesellschaft, Hoellriegelskreuth, Germany

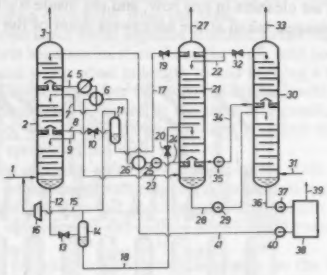
Filed Nov. 25, 1975, Ser. No. 635,041
Claims priority, application Germany, Oct. 30, 1975, 2548700
Int. Cl.[2] B01D 53/00
U.S. Cl. 55—68 27 Claims

1. In a process for the separation of substantially pure carbon dioxide and a gas enriched in hydrogen from a raw gas consist-

ing essentially of carbon dioxide, hydrogen and hydrogen sulfide, the steps of:

a. scrubbing said raw gas in a first scrubbing stage with a first fraction of partially loaded physical scrubbing agent to obtain a partially scrubbed raw gas and a more loaded scrubbing agent;

b. scrubbing said partially scrubbed raw gas in a second stage with physical scrubbing agent to obtain a further scrubbed raw gas enriched in hydrogen and said partially loaded physical scrubbing agent;



c. subjecting said more loaded scrubbing agent to at least one pressure reducing stage to obtain a gaseous phase therefrom;

d. subjecting a second fraction of said partially loaded scrubbing agent to at least one pressure-reducing stage to obtain reduced pressure liquid phase substantially free of hydrogen sulfide; and

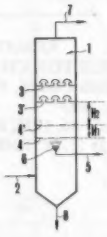
e. scrubbing said gaseous phase of step (c) with at least a fraction of liquid phase of step (d) to obtain a scrubbed substantially pure carbon dioxide stream and a scrubbing solution containing carbon dioxide and hydrogen sulfide.

4,050,910

APPARATUS AND METHOD FOR REMOVING PITCH FROM THERMALLY CRACKED GAS

Takao Ishihara; Kiyoji Sanpei; Hiroshi Nabatame, and Shoichi Motokawa, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1976, Ser. No. 732,298
Claims priority, application Japan, Oct. 14, 1975, 50-122854
Int. Cl.² B01D *46/04*
U.S. Cl. 55—96 **2 Claims**



1. A process for removing pitch from a gas derived from the thermal cracking of petroleum oil comprising:

passing the gas with the entrained pitch through a demister containing a plurality of bubble-cap trays and a plurality of sieve trays mounted below the bubble-cap trays, the distance between the lower surface of the lowermost bubble-cap tray and the upper surface of the uppermost sieve tray being at least twice the distance between adjoining sieve trays; and

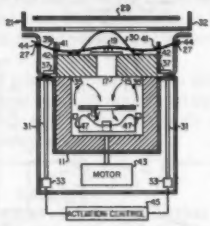
spraying a cleaning oil against the lower surface of the lowermost sieve tray at a rate of 0.1 to 1.0 m^3/hr. per unit area m^2 of the bottom surface of the lowermost sieve tray to prevent deposition of pitch.

4,050,911

GAS CHROMATOGRAPH OVEN

Paul Bryce Welsh, Wilmington, Del., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 499,894, Aug. 23, 1974, abandoned.
This application May 29, 1975, Ser. No. 582,053
Int. Cl.² B01D *15/08*
U.S. Cl. 55—197 **9 Claims**



1. A gas chromatograph oven comprising:

a thermally insulated housing having an oven door assembly closing one side thereof, one side of said housing defining a first air passage;

rotating stirring fan means for producing a high pressure region and a low pressure region within said housing;

said oven door assembly including:

a frame;

a hatch;

said hatch being movable into spaced-apart relation with said housing to define a second air passage;

spring biasing means disposed between said hatch and said door frame to maintain closure of the housing open side by said hatch;

cover means coupled with said hatch for selectively opening and closing said first air passage in response to the establishment and closure respectively, of said second air passage by movement of said hatch;

actuation means for moving said hatch in opposition to said hatch spring biasing means, thereby to establish said second air passage and to open said first air passage;

one of said first and second air passages being disposed adjacent said low pressure region to duct ambient room temperature air into said housing; and

the other of said first and second air passages being disposed adjacent to said high pressure region to exhaust air from said housing.

4,050,912

APPARATUS FOR COOLING HOT GASES

Klaus H. Hemsath, and Arvind C. Thekdi, both of Sylvania, Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed May 19, 1976, Ser. No. 687,816
Int. Cl.² B01D *47/14*
U.S. Cl. 55—223 **4 Claims**

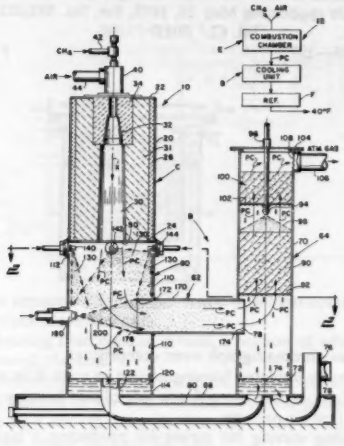
1. Apparatus for scrubbing, quenching, cooling hot gases comprising:

a generally U-shaped configuration having first, second and third steel plate, tubular members;

said first tubular member extending generally in a first plane and having an open upper end and a closed lower end, said first tubular member adapted to receive said hot gases through said upper end; liquid boundary forming means spaced about the peripheral interior of said first tubular member for forming a liquid boundary circumscribing the

interior of said first tubular member to prevent hot spots from occurring in said first tubular member;

said second tubular member positioned generally transverse to said first tubular member in a second plane and having an inlet end extending into said first member and defining the outlet of said first member and an outlet at its opposite end, jet pump cooling means in said first tubular member directing a high speed, finely divided liquid spray into said



second tubular member for entraining and aspirating said hot gases in said spray and substantially cooling said hot gases as said gases travel the length of said second tubular member; and

said third tubular member extending generally transverse to said second member, said third member having an outlet at its upper end, a closed lower end and an inlet defining said outlet of said second member, and means for scrubbing said cooled gases between its outlet and its inlet.

4,050,913

VORTEX AIR CLEANER ASSEMBLY WITH ACOUSTIC ATTENUATOR

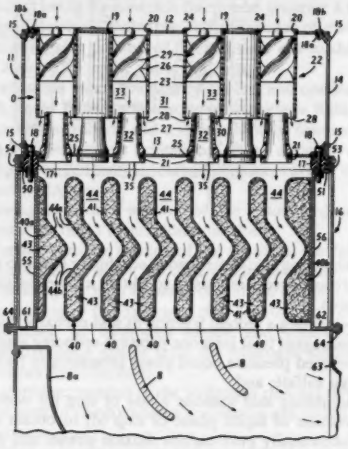
Charles J. Roach, Brooklyn, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Continuation-in-part of Ser. No. 484,001, June 28, 1974, abandoned, which is a continuation of Ser. No. 316,326, Dec. 18, 1972, abandoned. This application Apr. 23, 1975, Ser. No. 571,032

Int. Cl.[2] B01D *45/14*

U.S. Cl. 55—276 **18 Claims**

1. A vortex air cleaner-acoustic attenuator comprising, in combination, a housing having an inlet and an outlet arranged for air flow therethrough; and, disposed in the housing across the line of air flow from the inlet to the outlet, in sequence, a first array comprising a plurality of vortex air cleaners, in which the vortex air cleaners comprise a straight tubular air cleaner body having a cylindrical central passage with an inlet and an outlet at opposite ends, and a deflector adjacent the inlet for creating a vortex stream in the influent air to concentrate any contaminant particles in the air at the periphery of the passage, and clean the air at the center of the passage, and an outlet member having a central clean air passage communicating with the cylindrical central passage of the tubular body and disposed within the passage at the outlet, the exterior wall of the outlet member defining a generally annular contaminant scavenge passage within the cylindrical central passage of the tubular body through which pass contaminant particles, while relatively clean air at the center of the passage passes through the central clean air passage of the outlet member; and a second array comprising a plurality of spaced acoustic sheets defining passages therebetween arranged in flow communication with the clean air passages of the outlet members of the vortex air cleaners in the first array, the acoustic sheet passages having a diameter that is approximately the same as the diameter at the narrowest point of the clean air passages of the outlet members of the vortex air cleaners in the air cleaner array, so that the total of acoustic sheet thickness plus acoustic sheet passage diameter approximates the total of clean air passage inside diameter at the narrowest point plus the distance between the inside walls of the clean air passages, taken at the narrowest point of the clean air passages, of the outlet members of the air cleaners in one row, and the inside walls of the clean air passages, taken at the narrowest point of the clean air pas-



sages, of the outlet members of the air cleaners in the next adjacent row in the air cleaner array feeding air into the acoustic sheet passages, the inlet end openings of the acoustic sheet passages being substantially in alignment with the air cleaner passages for direct flow thereinto from the vortex air cleaner array in a straightthrough course, the acoustic sheets being arranged to deflect such air at least once from the acoustic surface of the sheets in the course of travel through the passages, the total pressure drop across the combination of vortex air cleaner array and array of intercepting spaced acoustic sheets being less than the additive pressure drop across either the vortex air cleaner array or the array of intercepting acoustic sheets, taken separately.

4,050,914

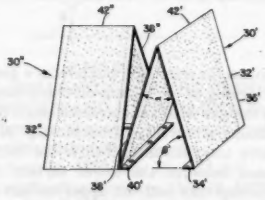
ACCELERATOR FOR CHARGED PARTICLES

David R. Murphy, Falls Church, Va., assignor to S.A.E.S. Getters S.p.A., Milan, Italy

Filed July 26, 1976, Ser. No. 708,645

Int. Cl.[2] B01D *53/04*; F04B *37/02*; H01J *43/28*

U.S. Cl. 55—387 **3 Claims**



1. An accelerator for charged subatomic particles said accelerator comprising:

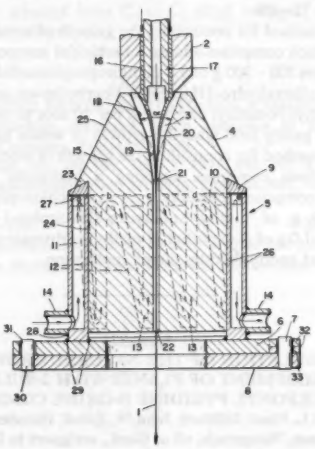
A. A vacuum chamber defined by gas-tight walls,
B. A means within said chamber for producing a beam of charged particles, and
C. A means for inhibiting secondary emissions said means comprising outwardly extending wedge-shaped members covering the inner surface of the walls of the vacuum chamber, each said member comprising:
1. a sheet metal strip, said sheet metal strip comprising:
a. a first wing parallel to and attached to the inner surface of the wall,
b. a first sheet metal segment attached to the wing and extending outwardly from the wall,
c. a second sheet metal segment attached to the edge of the first segment furthest from the wall, said second segment being equal in length to and forming a dihedral angle of less than 90° with the first segment, and
d. a second wing attached to the second segment, said second wing being parallel to and attached to the inner surface of the wall, and
2. a coating on both sides of the sheet metal strip, said coating consisting of particles of a nonevaporable getter metal embedded in the sheet metal strip without substantial reduction of the surface area of said particles, and
3. a means for attaching the sheet metal strip to the inner surface of the wall of the vacuum chamber, said means comprising spot welds attaching the first and second wings to the inner surface of the wall wherein the first and second wings of the sheet metal strip extend toward each other, the first wing forming a dihedral angle of less than 90° with the first segment and the second wing forming a dihedral angle of less than 90° with the second segment.

4,050,915

FERRULE AND USE THEREOF FOR COOLING A MELT SPUN HOLLOW GLASS FIBER AS IT EMERGES FROM A SPINNERETTE

William E. Brown, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 4, 1976, Ser. No. 729,440
Int. Cl.² C03B *37/02*
U.S. Cl. 65—1 **13 Claims**



1. A ferrule having utility for uniformly cooling an individual, melt-spun, hollow glass fiber, without making substantial contact with the fiber, as it issues from a spinnerette and passes downwardly through the ferrule,

said ferrule having a rigid, heat-conductive body member, an interior wall of which defines a vertical, rectilinear passageway extending completely through said member and having the general shape of a long-stemmed, conical funnel, every cross-section of said passageway along its axis being generally circular in shape,

said ferrule being adapted, by generally vertical cuts which form a slot therein or divide the ferrule into mating segments, so that it can be emplaced adjacent to a spinnerette and closely fitted around a moving fiber is issuing therefrom, in a position such that the axes of the fiber and passageway will coincide and the fiber will enter the funnel-shaped portion of said passageway as it leaves the spinnerette and exit from the lower terminus of the stem-shaped section,

the width of said slot or the widths of the spaces between the mated segments being such that not more than 25 percent of any circumference of said passageway is interrupted by said slot or spaces,

said ferrule, or each of said segments, being so composed as to have an average heat conductivity at least equal to that of graphite and being adapted to be brought into heat-transfer-effective contact with a heat sink.

4,050,916

METHOD AND APPARATUS FOR FORMING KINKY FIBERS FROM GLASS

Robert G. Russell, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 608,420, Aug. 28, 1975, abandoned, which is a continuation of Ser. No. 469,729, May 13, 1974, abandoned. This application Nov. 26, 1976, Ser. No. 745,028
Int. Cl.² C03B *37/02*
U.S. Cl. 65—2 **11 Claims**

1. The method of forming fibers of heat-softened glass including flowing streams of the glass in a row from a feeder, the regions of the streams adjacent the feeder being cone-shaped, attenuating the streams of glass to fibers, impinging a coherent stream of liquid against the tips of the cones of the glass streams to effect successive distortions of the tips of the cones of glass, and reducing the temperature of the glass streams at the distortions by the stream of liquid at a rate sufficient to form successive permanent bends in the attenuated fibers.

4,050,917

PROCESS OF CONVERSION OF SOLID WASTE INTO WORKABLE MATERIAL WITH PREDETERMINED CHARACTERISTICS AND/OR INTO FERTILIZERS OR SOIL IMPROVING AGENTS

Stephen Varro, 425 E. 51st St., New York, N.Y. 10022

Filed Sept. 2, 1975, Ser. No. 609,697
Claims priority, application Germany, Aug. 30, 1974, 2441716
Int. Cl.² C05F *11/08*
U.S. Cl. 71—9 **3 Claims**

1. A process for composting waste material including the following steps:

supplying raw waste material;

grinding said supplied waste material into particles;

extracting said ground particles within a predetermined size range;

extracting iron containing particles from said particles within said predetermined size range;

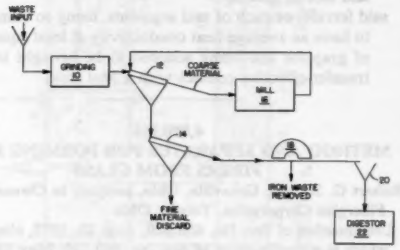
digesting said particles within said predetermined size range having said iron particles extracted therefrom;

said step of digesting includes the steps of:

exposing said digesting particles to oxygen by raking said digesting particles;

controlling said exposure by controlling the rate of raking;

continually controlling the pH value of said digesting particles by selectively adding a water diluted nitrogen-phosphorous buffer solution having a pH value within the range of 6.2 to 6.8% in order to produce a digested material having a stable pH value of approximately 7.3;



continually controlling the moisture content of said digesting particles according to a linear value of moisture content with respect to time by selectively adding relatively hot water to produce a digested material having a moisture content in the range of from 10–30% by weight;

continually controlling the temperature of said digesting particles within a predetermined temperature range;

advancing said digesting particles over a series of stacked horizontal decks by said step of raking and performing said steps of continually controlling the pH value and continually controlling the moisture content in response to steps of monitoring the pH value and moisture content at a plurality of predetermined locations along said horizontal decks.

4,050,918

HERBICIDAL SEMICARBAZIDES

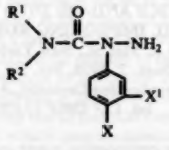
Kurt H. G. Pilgram, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 471,380, May 20, 1974, Pat. No. 3,984,463, which is a continuation-in-part of Ser. No. 445,396, Feb. 25, 1974, abandoned, which is a continuation of Ser. No. 283,687, Aug. 25, 1972, abandoned. This application May 19, 1976, Ser. No. 687,721

Int. Cl.² A01N *9/36, 9/14, 9/20*

U.S. Cl. 71—86 **7 Claims**

1. A method for controlling undesirable plant growth which comprises applying to the locus to be protected, in amount sufficient to exert herbicidal action, a compound of the formula



wherein R^1 and R^2 are each independently alkyl of 1 to 4 carbon atoms; X and X^1 each is halogen of atomic number 9 to 35, inclusive, or an acid addition salt thereof selected from the group of hydrochloric, hydrobromic, sulfuric, phosphoric, nitric, maleic, fumaric, citric tartaric, methanesulfonic, ethanesulfonic, acetic or benzoic acids.

4,050,919

PROCESS FOR DEVELOPING SEEDLESS FLESHY BERRY OF GRAPES

Yoshie Motomura, Sendai, and Jiro Ishiyama, Noda, both of Japan, assignors to Kikkoman Shoyu Co., Ltd., Noda, Japan

Filed Apr. 6, 1976, Ser. No. 674,078

Claims priority, application Japan, Apr. 8, 1975, 50-41876

Int. Cl.² A01N *9/36, 9/12*

U.S. Cl. 71—86 **11 Claims**

1. A process for developing seedless, fleshy berry of grapes which comprises contacting the flower bunches of grapes with an effective amount of an aqueous solution containing gibberellin and at least one cyclic 3′, 5′-adenylic acid compound selected from the group consisting of cyclic 3′, 5′-adenylic acid, alkali metal and alkaline earth metal salts of cyclic 3′, 5′-adenylic acid, and derivatives of cyclic 3′, 5′-adenylic acid, said gibberellin and cyclic 3′, 5′-adenylic acid being present in the concentration of 10 to 300 p.p.m. and 1 to 10,000 p.p.m., respectively, and said derivatives of cyclic 3′, 5′-adenylic acid being selected from the group consisting of 6-benzyl-cyclic 3′, 5′-adenylic acid, 6-allyl-cyclic 3′, 5′-adenylic acid, 8-bromo-cyclic 3′, 5′-adenylic acid, 8-iodine-cyclic 3′, 5′-adenylic acid, 9-methyl-cyclic 3′, 5′-adenylic acid, N^6, $O^{2'}$-(dibutyl ester)-cyclic 3′, 5′-adenylic acid and N^6-(butyl ester)-cyclic 3′, 5′-adenylic acid.

4,050,920

HERBICIDAL COMPOSITION FOR PADDY FIELD USE

Tetsuo Takematsu; Makoto Konnai, both of Utsunomiya; Takayuki Isogawa, Tokyo, and Koshiro Kodama, Noshiro, all of Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

Filed Sept. 26, 1975, Ser. No. 617,246

Claims priority, application Japan, May 8, 1975, 50-55636; Sept. 26, 1974, 49-110897

Int. Cl.² A01N *9/22*

U.S. Cl. 71—88 **4 Claims**

1. A method for controlling the growth of weeds in a paddy field which comprises adding a herbicidal composition which comprises 200 – 300 g of 3,4-dichloropropionanilide, 150–250 g of S-ethylhexahydro-1H-azepine-1-carbothioate and 10–17 g of -β-naphthyl-N-methyl carbamate per 10 ares to the water of a flooded paddy field after the growth of weeds has ensued.

2. A method for controlling the growth of weeds in a paddy field which comprises applying a herbicidal composition which comprises 200–300 g of 3,4-dichloropropionanilide, 150–250 g of S-ethyl-hexahydro-1H-azepine-1-carbothioate and 0.5–1.0 g of β-naphthyl-N-methyl carbamate per 10 ares to a flooded paddy field by direct application.

4,050,921

REGULATION OF THE NATURAL GROWTH OR DEVELOPMENT OF PLANTS WITH 2-SULFINYL OR 2-SULFONYL PYRIDINE N-OXIDE COMPOUNDS

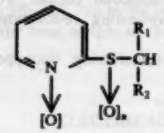
Howard L. Plant, Milford; John W. Zukel, Hamden, and Ronald B. Ames, Naugatuck, all of Conn., assignors to Uniroyal Inc., New York, N.Y.

Filed Apr. 16, 1976, Ser. No. 677,660

Int. Cl.² A01N *9/22*

U.S. Cl. 71—94 **22 Claims**

1. A method of regulating the natural growth or development of plants which comprises applying to said plants an effective non-herbicidal plant-regulating amount of a 2-sulfinyl-, or 2-sulfonyl-pyridine N-oxide compound of the formula



wherein:

n is 1 or 2;

R_1 is hydrogen, C_1 to C_{15} alkyl, phenyl or benzyl;

R_2 is hydrogen,

C_1 to C_{12} alkyl,

C_1 to C_4 alkenyl,

C_2 or C_3 alkoxycarbonyl,

C_5 or C_6 alicyclic,

phenyl provided R_1 is not phenyl,

phenyl substituted with from 1 to 3 substituents which may be the same or different and are selected from the group consisting of C_1 to C_3 alkyl, halogen, cyano, nitro, C_1 or C_2 alkoxy, phenoxy, dioxymethylene and 2,2-dichlorocyclopropyl; and phenyl substituted with 4 to 5 substituents which may be the same or different and are selected from methyl and chlorine;

1-methyl-2,2-dichlorocyclopropyl,

2,2-dichlorocyclopropyl,

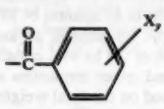
naphthyl, 9-anthryl, 5-indanyl,

4-biphenylyl,

2-benzothiazolyl, 2-thienyl or benzyl;

R_1 and R_2 may be joined together in the form of a polymethylene chain $-(CH_2)_m-$ where *m* is 3,4 or 5 to form a carbocyclic ring;

and when R_1 is hydrogen or methyl R_2 can be the radical



where *y* is 0, 1 or 2 and the X's are the same or different and are selected from C_1 to C_3 alkyl, halogen, and 2,2-dichlorocyclopropyl.

4,050,922

SUBSTITUTED BENZENE-METHANOL COMPOUNDS

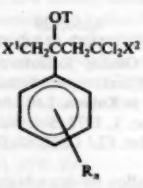
Lowell D. Markley, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 466,569, May 3, 1974, Pat. No. 3,972,913. This application Mar. 17, 1976, Ser. No. 667,780

Int. Cl.² A01N *9/24*

U.S. Cl. 71—106 **37 Claims**

1. A composition comprising an inert carrier and a herbicidally-effective amount of a compound of the formula:



wherein x^1 represents bromo, chloro or iodo, X^2 represents hydrogen, chloro or methyl; *n* represents an integer of 0 to 3, inclusive; R is ring-substituted in the 3-, 4- or 5-positions and each R independently represents hydrogen, trifluoromethyl, alkyl of from 1 to about 3 carbon atoms, alkoxy of from 1 to about 3 carbon atoms, bromo, chloro, fluoro or nitro, and T represents hydrogen,

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4,050,923

N-BENZYL-2-(3,5-DIMETHYL PHENOXY)-2-ALKOXY AMIDE HERBICIDES

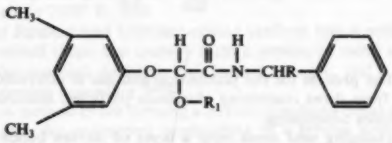
Don R. Baker, Orinda, and Francis H. Walker, Mill Valley, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed June 30, 1975, Ser. No. 591,686

Int. Cl.² A01D *9/20*

U.S. Cl. 71—118 **3 Claims**

1. The method of controlling undesirable vegetation which comprises applying to the area where control of said vegetative growth is desired, an herbicidal amount of a compound having the formula



in which R is hydrogen or alkyl having 1 to 4 carbon atoms and R^1 is alkyl having 1 to 4 carbon atoms.

4,050,924

PROCESS OF CONTROLLING FE++ CONTENT OF SINTERED IRON ORE

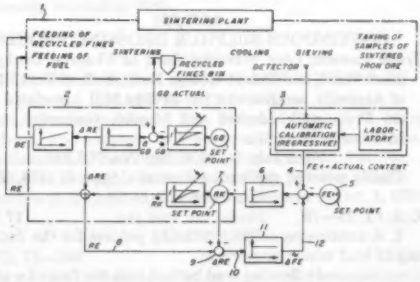
Fred Cappel, Sprendlingen; Walter Hastik, Frankfurt am Main, both of Germany; Georg Fleming, and Pierre Hofmann, both of Esch, Alzette, Luxembourg, assignors to Dravo Corporation, Pittsburgh, Pa.

Filed Dec. 3, 1975, Ser. No. 637,395

Claims priority, application Germany, June 3, 1975, 2524444

Int. Cl.² C22B *1/16*

U.S. Cl. 75—5 **5 Claims**



1. In a process for controlling the quality of sintered iron ore produced in a belt-type continuous sintering operation wherein a recycled-fines balance controller regulates the fuel rate and the recycled-fines feed rate to maintain a recycled-fines balance, the improvement comprising: determining the actual Fe^{++} content of the sintered iron ore, selecting a preset Fe^{++} content, applying the difference between the actual Fe^{++} content preset Fe^{++} content to an Fe^{++} content controller to produce a desired fines withdrawal rate, and modifying the

recycled-fines feed rate as a function of the desired fines withdrawal rate to correct the Fe^{++} content to the preset value.

4,050,925

PROCESS FOR THE PRODUCTION AND USE OF ACTIVATED ALUMINA IN REFINING STEEL

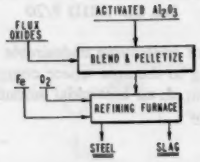
Arthur F. Johnson, Franklin Lakes, N.J., assignor to R.C.M. Corporation, Fontana, Calif.

Division of Ser. No. 483,129, June 26, 1974, Pat. No. 3,955,969. This application Jan. 28, 1976, Ser. No. 653,263

The portion of the term of this patent subsequent to May 11, 1983, has been disclaimed.

Int. Cl.[2] C21B *3/02, 5/04*

U.S. Cl. 75—30 **4 Claims**



1. The process for the production and use of activated alumina from dross containing aluminum particles, alumina and impurities comprising:

a. changing said dross onto a layer of molten halide salts underlain by a layer of molten aluminum in a holding furnace, whereby a portion of the aluminum entrained within the dross enters the aluminum layer and the alumina and impurities are entrained in the halide flux layer;

b. separating said dross from said molten aluminum; digesting said dross with hot water to at least partially dissolve halide salts and other soluble impurities and decompose insoluble impurities;

c. separating remaining aluminum particles and the purified alumina from said water as separate fractions;

d. calcining said alumina under conditions controlled to produce an activated alumina;

e. blending said calcined alumina with binders and slag-formers;

f. pelletizing the mixture so formed; and

g. using the pellets in the refining of steel, whereby a more fluid slag is formed.

4,050,926

CONTINUOUS SULPHUR DROSSING PROCESS

Frank Lawson; Glen Waverley, both of Victoria; Denby Harcourt Ward, and Robert George Kelly, both of Port Pirie, all of Australia, assignors to The Broken Hill Associated Smelters Proprietary Limited and Monash University, both of Melbourne, Australia

Filed July 14, 1976, Ser. No. 705,356

Claims priority, application Australia, Sept. 8, 1975, 3079/75

Int. Cl.[2] C22B *13/06*

U.S. Cl. 75—78 **17 Claims**

1. A continuous sulphur drossing process for the decoppering of lead which comprises:

continuously flowing lead bullion into the first of a series of at least two reaction vessels;

continuously agitating the lead bullion in the first reaction vessel;

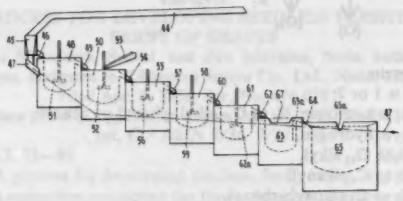
continuously adding sulphur to the lead bullion in the first reaction vessel during the continuing agitation;

continuously and concurrently transferring the lead bullion, dross arising from copper reacted with the sulphur, and any unreacted sulphur from each reaction vessel to the next in the series, without backmixing;

continuously agitating the contents of each reaction vessel;

maintaining the average total residence time of the materials in the reaction vessels below that within which a significant amount of reversion to elemental copper would occur, thereby substantially preventing re-solution of copper in the bullion;

continuously and concurrently transferring decoppered bullion and dross from the final reaction vessel in the series to an unagitated dross separation vessel;



removing the dross from the surface of the decoppered bullion in the dross separation vessel; and

continuously withdrawing decoppered bullion from the dross separation vessel.

4,050,927

ALLOYED STEEL

Shinichi Murakami, Osaka; Katsutaro Akamatsu, Hirakata, and Hisashi Hiraishi, Kyoto, all of Japan, assignors to Kubota, Ltd., Japan

Filed Dec. 1, 1975, Ser. No. 636,643

Int. Cl.[2] C22C *30/00*

U.S. Cl. 75—122 **13 Claims**

1. An alloy having high heat and wear resistance, which consists essentially of carbon in an amount of 0.30 to 0.50%, silicon in an amount of 1.0 to 1.8%, manganese in an amount of 1.0 to 1.8%, chromium in an amount of 26 to 30%, nickel in an amount of 18 to 22%, tungsten in an amount of 0.5 to 6%, nobium in an amount of 0.5 to 4%, cobalt in an amount of 18 to 22%, and iron and other impurities as a remainder, said percentage being based on the total weight of the composition.

4,050,928

CORROSION-RESISTANT MATRIX-STRENGTHENED ALLOY

James Roy Crum, Ona, W. Va., assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Feb. 17, 1976, Ser. No. 658,227

Int. Cl.[2] C22C *30/02, 38/06, 38/42*

U.S. Cl. 75—124 **11 Claims**

1. An alloy consisting essentially of 18% to 30% nickel and 20% to 30% chromium with the nickel-to-chromium ratio of up to 1.0, 1.7% to about 3% aluminum, 1% to about 5% copper, 0.03% to 0.08% carbon, up to 0.6% silicon, up to about 1.5% manganese, up to 0.06% calcium and balance essentially iron in an amount at least 44% of the alloy.

4,050,929

HEAT RESISTING ALLOYED STEEL

Shinichi Murakami, Osaka; Katsutaro Akamatsu; Toshiaki Morichika, both of Hirakata, and Hisashi Hiraishi, Kyoto, all of Japan, assignors to Kubota, Ltd., Japan

Filed Dec. 1, 1975, Ser. No. 636,644

Int. Cl.[2] C22C *30/00*

U.S. Cl. 75—171 **2 Claims**

1. A heat resisting alloy having a high compressive strength at elevated temperature which consists essentially of carbon in an amount of not more than 0.15%, silicon in an amount of 1 to 2%, chromium in an amount of 25 to 32%, manganese in an amount of 1 to 2, nickel in an amount of 10 to 25%, cobalt in an amount of 25 to 45%, molybdenum in an amount of 0.3 to 10%, phosphorus in an amount of not more than 0.04%, sulfur

in an amount of not more than 0.04%, niobium in an amount of 0 to 3%, and iron as the remainder, said percentage being based on the total weight of the composition.

4,050,930

ELECTRICAL CONTACT MATERIAL

Kenya Motoyoshi; Masahiro Kume, and Yoshinari Amano, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 16, 1976, Ser. No. 667,373
Claims priority, application Japan, June 24, 1975, 50-78785
Int. Cl.[2] C22C 5/06
U.S. Cl. 75—173 A 3 Claims

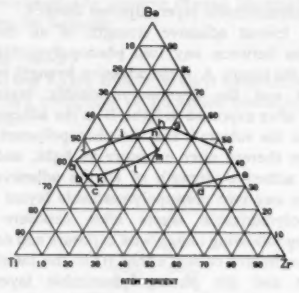
1. An electrical contact material produced by internal oxidation of an alloy consisting of 1–15% by weight of metal indium, 0.5–12% by weight of metal tin, 0.01–5% by weight of one metal selected from the group consisting of manganese and molybdenum, and the balance silver, wherein oxides are formed by said internal oxidation which are spherical in shape and finely and uniformly dispersed.

4,050,931

AMORPHOUS METAL ALLOYS IN THE BERYLLIUM-TITANIUM-ZIRCONIUM SYSTEM

Lee Elliot Tanner, Summit; Ranjan Ray, Morristown, both of N.J., and Carl F. Cline, Walnut Creek, Calif., assignors to Allied Chemical Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 604,510, Aug. 13, 1975, abandoned, which is a continuation-in-part of Ser. No. 572,563, April 28, 1975, Pat. No. 3,987,517, which is a continuation-in-part of Ser. No. 519,394, Oct. 30, 1974, abandoned. This application July 27, 1976, Ser. No. 709,028
The portion of the term of this patent subsequent to Nov. 2, 1993, has been disclaimed.
Int. Cl.[2] C22C 14/00, 16/00
U.S. Cl. 75—175.5 5 Claims



1. A high strength, low density metal alloy that is substantially amorphous, characterized in that the alloy consists essentially of a composition being defined within an area on a ternary diagram having as its coordinates in atom percent Be, atom percent Ti, and atom percent Zr, said area being defined by a polygon having at its corners the 10 points defined by

a. 40% Be, 58% Ti, 2% Zr
b. 35% Be, 57% Ti, 8% Zr
c. 30% Be, 55% Ti, 15% Zr
d. 30% Be, 20% Ti, 50% Zr
e. 35% Be, 0% Ti, 65% Zr
f. 45% Be, 0% Ti, 55% Zr
g. 55% Be, 15% Ti, 30% Zr
h. 55% Be, 20% Ti, 25% Zr
i. 50% Be, 35% Ti, 15% Zr
j. 43% Be, 53% Ti, 4% Zr.

4,050,932

COLLOIDAL GRAPHITE FORGING LUBRICANT AND METHOD

Harold G. Lemmer, New Baltimore, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 565,873, April 7, 1975. This application Aug. 5, 1976, Ser. No. 711,784
Int. Cl.[2] B22F 3/14, 3/24
U.S. Cl. 75—211 2 Claims

1. A method for hot forming highest quality ferrous powdered metal articles without a prior separate presintering operation, said method comprising the steps of:

coating an unsintered powdered steel preform with a colloidal graphite forging lubricant containing at least about 2%, by weight, powdered copper for suppressing an adverse lubricant-preform interaction above a temperature of about 2050° F., said powdered copper having an average particle size less than about 50 microns,

induction heating said lubricant-coated preform to a temperature of about 2100°–2500° F. to sinter said preform without incurring an attendant adverse lubricant-preform interaction,

cooling said preform to a hot forming temperature below about 2000° F., and

hot forming said lubricant-coated preform into a predetermined shape and thereby form a powdered metal article having high ductility, high impact strength, and a metal density exceeding 99%.

2. A method of hot forming a ferrous powdered metal article that includes concurrent presintering of a ferrous powdered metal preform during the same heating operation and with the same induction heating equipment used to heat presintered ferrous powdered metal preforms to hot forming temperatures,

heating an unsintered ferrous powdered metal preform to a temperature of about 250°–600° F.,

dipping said heated preform into a colloidal graphite hot forming lubricant containing about 2%–4%, by weight, powdered copper, said powdered copper having a particle size no greater than about 15 microns,

induction heating said preform to a temperature of about 2300°–2400° F. for about 1 minute to sinter said preform without incurring an attendant adverse lubricant-preform interaction,

cooling said preform to a temperature of about 1400°–1800° F., and

hot forming said lubricant-coated preform into a predetermined shape and thereby form a powdered metal article having high ductility, high impact strength, and a metal density exceeding 99%.

4,050,933

IMPERVIOUS METAL OBJECT AND METHOD OF MAKING THE SAME

Howard I. Sanderow, Cherry Hill, N.J., and Kenneth M. Merz, Malvern, Pa., assignors to Stanadyne, Inc., Hartford, Conn.

Continuation of Ser. No. 334,242, Feb. 21, 1973, Pat. No. 3,838,982. This application July 3, 1974, Ser. No. 485,450
The portion of the term of this patent subsequent to Oct. 1, 1991, has been disclaimed.
Int. Cl.[2] C22C 1/04
U.S. Cl. 75—246 14 Claims

1. A method of making an impervious metal body comprising the steps of

completely coating iron powder particles with a layer of copper which is about 12% to about 30% by weight of the body,

compressing said coated particles together, and heating the compressed particles to a temperature at which the copper layer melts and the melted copper flows and fills the voids between the particles.

7. An impervious metal body produced by completely coating iron powder particles with a layer of copper which is about 12% to about 30% by weight of the body, compressing the

coated particles together, and heating the compressed particles to a temperature at which the copper layer melts and the melted copper flows and fills the voids between the particles.

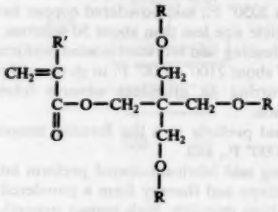
4,050,934

ELECTRON ACCEPTOR MONOMERS AND POLYMERS

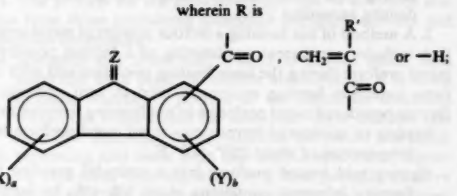
Sam R. Turner, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 22, 1975, Ser. No. 615,664
Int. Cl.² G03G 13/00, 5/04
U.S. Cl. 96—1 R 4 Claims

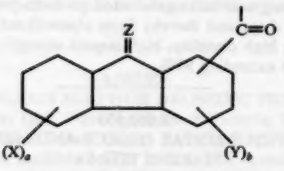
1. An electrophotographic imaging member having a photoconductive insulating layer comprising a monomer of the formula



wherein R is



R′ is hydrogen or methyl;
X and Y are independently selected from the group consisting of —NO_2, halogen, cyano and —CF_3;
Z is oxygen or dicyanomethylene; and
a and *b* can range from 0 to 3; with the proviso that at least one of R is



4,050,935

TRIGONAL SE LAYER OVERCOATED BY BIS(4-DIETHYLAMINO-2-METHYLPHENYL)-PHENYLMETHANE CONTAINING POLYCARBONATE

William W. Limburg, Penfield; John F. Yanus, Webster, and Damodar M. Pai, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 2, 1976, Ser. No. 673,235
Int. Cl.² G03G 5/04, 5/08
U.S. Cl. 96—1 PC 28 Claims

1. An imaging member comprising a layer of trigonal selenium and a contigous layer of electrically active material consisting essentially of an electrically inactive polycarbonate resin having dispersed therein from about 15 to about 75 percent by weight of bis(4-diethylamino-2-methylphenyl)-phenylmethane said trigonal selenium exhibiting the capability of photogeneration of holes and injection of said holes and said electrically active material being substantially non-absorbing in the spectral region at which the trigonal selenium generates and photo-generated holes but being capable of supporting the injection of photo-generated holes from said trigonal selenium and transporting said holes through said electrically active material.

4,050,936

IMAGE FORMING PROCESS WITH PHOTOPOLYMER LAYERS BETWEEN A SUPPORT AND A SUBSTRATE

Keiji Takeda; Masataka Murata, and Teppei Ikeda, all of Minami-Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 29, 1975, Ser. No. 645,148
Claims priority, application Japan, Dec. 28, 1974, 50-300
Int. Cl.² G03C 11/12, 5/00
U.S. Cl. 96—28 25 Claims

1. An image forming process which comprises image-wise exposing a photosensitive material to light, the photosensitive material comprising a support and a substrate with a photopolymerizable material therebetween, where either or both of the support or substrate is transparent and image-wise exposing is through the transparent support and/or substrate, and stripping off the support to leave either exposed areas or non-exposed areas of the photopolymerizable material on the substrate, in which the photopolymerizable material is characterized by comprising at least two different photopolymerizable layers which each comprise one or more addition polymerizable monomers, one or more photopolymerization initiators and one or more binders, which photopolymerizable layers are placed adjacent the transparent support and the substrate, wherein at least one of the ingredients or the ratio of the ingredients of the photopolymerizable layers is different in at least the two different photopolymerizable layers, and the photopolymerizable layers have the relationship of C>A>B and C′>B′>A′ or C>B>A and C′>A′>B′, wherein:

A is the adhesive strength between the support and the photopolymerizable layer adjacent thereto;

B is the adhesive strength between the substrate and the photopolymerizable layer adjacent thereto;

C is the lowest adhesive strength of all the adhesive strengths between any two photopolymerizable layers among the layers, A′ is the adhesive strength between the support and the photopolymerizable layer adjacent thereto after exposure to light, B′ is the adhesive strength between the substrate and the photopolymerizable layer adjacent thereto after exposure to light, and C′ is the lowest adhesive strength of all the adhesive strengths between any two photopolymerizable layers among the photopolymerizable layers after exposure to light, whereby following image-wise exposure and delamination cohesive failure occurs either (i) at the interface of the support and the photopolymerizable layer adjacent thereto or (ii) at the interface of the substrate and the photopolymerizable layer adjacent thereto, thereby providing negative and positive images in complimentary relationship in accordance with the following:

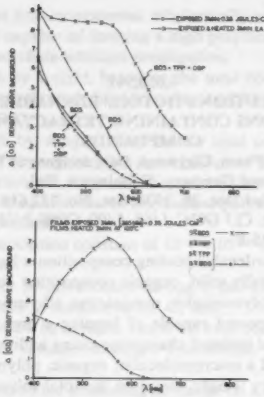
1. In the case of cohesive failure as described at (i), the substrate carrying the layer of the photopolymerizable composition adjacent thereto and areas of the photopolymerizable composition originally on the support in correspondence to the image-wise exposure, with the support carrying a complementary image of the photopolymerizable composition originally on the support; or
2. In the case of cohesive failure as described at (ii), the support carrying the layer of the photopolymerizable composition adjacent thereto and areas of the photopolymerizable composition originally on the substrate in correspondence to the image-wise exposure, with the substrate carrying a complementary image of the photopolymerizable composition originally on the substrate.

4,050,937

IMAGEWISE EXPOSING AND HEATING A MICROIMAGING FILM CONTAINING AN ORGANO DISELENIDE, A TERTIARY PHOSPHINE OR PHOSPHITE AND AN ORGANIC PEROXIDE

Dana G. Marsh, Rochester, and Joseph Y. C. Chu, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 13, 1976, Ser. No. 749,636
Int. Cl.[2] G03C 5/24
U.S. Cl. 96—48 R 10 Claims



1. An imaging method comprising the steps of:

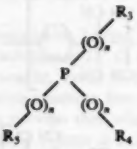
a. providing a film of an organic polymer as matrix material having uniformly dispersed therein:

i. a photochemically reactive organo diselenide characterized by the formula:

$$R_1—Se—Se—R_2$$

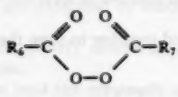
wherein R_1 and R_2 are aralkyl or alkyl hydrocarbon moieties;

ii. a tertiary phosphine or phosphite characterized by the formula:



wherein each *n* is 0 in the case of a phosphine and 1 in the case of a phosphite and R_3, R_4 and R_5 are independently substituted or unsubstituted aryl hydrocarbon moieties; and

iii. an organic peroxide characterized by the formula:



wherein R_6 and R_7 are aryl or substituted aryl;

b. exposing the film in an imagewise manner to ultraviolet radiation to form an image therein; and

c. heating the exposed film to a temperature of at least about 100° C for a time sufficient to enhance the image contrast.

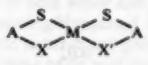
4,050,938

PHOTOGRAPHIC ELEMENTS INCORPORATING CHELATED-METAL QUENCHING COMPOUNDS

Wendell F. Smith, Jr, Fairport, and George A. Reynolds, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

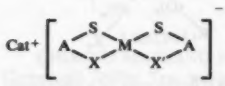
Continuation-in-part of Ser. No. 420,179, Nov. 29, 1973, abandoned. This application July 1, 1975, Ser. No. 592,300
Int. Cl.[2] G03C 1/84, 1/76
U.S. Cl. 96—84 R 20 Claims

1. A photographic element comprised of a support and containing one or more hydrophilic coatings thereon, at least one of which is radiation-sensitive, and at least one of said hydrophilic coatings including an organic dye selected from azine dyes, oxazine dyes, thiazine dyes, anthraquinone dyes, azo dyes, azomethine dyes, cyanine dyes, diphenylmethane dyes, triphenylmethane dyes, formazan dyes, induline dyes, indigoid dyes, phthalein dyes and pyronine dyes or a precursor of such a dye, dispersed in a water-immiscible solvent therefor, wherein the improvement comprises a stabilizing amount of a chelated-metal quenching compound incorporated within said water-immiscible solvent for said organic dye or dye precursor; said quenching compound having its longest wavelength absorption peak bathochromic to the longest wavelength absorption peak of said organic dye and having a structure selected from the group consisting of



I.

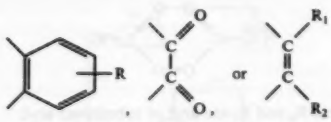
and



II.

wherein:

M is nickel, cobalt, copper, palladium or platinum; X and X' are independently selected from the group consisting of sulfur and oxygen; Cat^+ is a cation; and A is



wherein:

R is hydrogen or alkyl, and R_1 and R_2 are independently selected from the group consisting of hydrogen, phenyl, substituted phenyl, nitrile and alkyl.

4,050,939

MICROIMAGING FILM CONTAINING AN ORGANO DISELENIDE, A TERTIARY PHOSPHINE OR PHOSPHITE AND AN ORGANIC PEROXIDE

Dana G. Marsh, Rochester, and Joseph Y. C. Chu, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

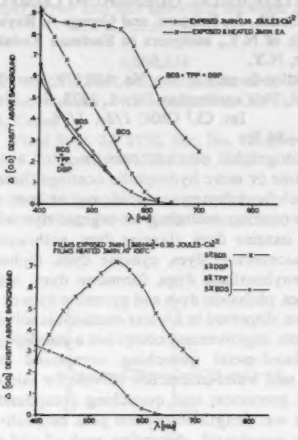
Filed Dec. 13, 1976, Ser. No. 749,635
Int. Cl.[2] G03C 1/84
U.S. Cl. 96—88 10 Claims

1. A microimaging composition comprising a film of an organic polymer as matrix material having uniformly dispersed therein:

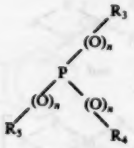
i. a photochemically reactive organo diselenide characterized by the formula:

$$R_1—Se—Se—R_2$$

wherein R_1 and R_2 are aralkyl or alkyl hydrocarbon moieties;

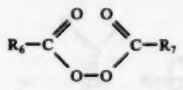


ii. a tertiary phosphine or phosphite characterized by the formula:



wherein each n is 0 in the case of a phosphine and 1 in the case of a phosphite and R_3, R_4 and R_5 are independently substituted or unsubstituted aryl hydrocarbon moieties; and

iii. an organic peroxide characterized by the formula:



wherein R_6 and R_7 are aryl or substituted aryl.

4,050,940

PROCESS FOR THE PREPARATION OF A PHOTOGRAPHIC MATERIAL

Teiji Habu; Masao Ishihara; Eiichi Sakamoto; Hiroshi Yamada, and Masaaki Kaneshige, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

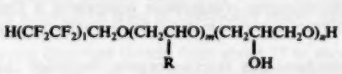
Filed Mar. 10, 1976, Ser. No. 665,438

Claims priority, application Japan, Mar. 15, 1975, 50-31391

Int. Cl.² G03C *1/38, 1/02, 1/76, 1/78*

U.S. Cl. 96—114.5 **4 Claims**

1. A process for the preparaton of a gelatin-silver halide photographic layer thereon which comprises forming the layer by coating with a coating solution which contains a compound represented by the following formula:



wherein R is hydrogen or methyl, l is an integer of 2 to 10 inclusive, m is an integer of 0 to 50 inclusive, and n is an integer of 0 to 50 inclusive, provided that when n is 1, R is methyl, and further provided that both m and n are not 0 simultaneously.

4,050,941

HIGH RESOLUTION PHOTOHARDENABLE COATING COMPOSITIONS CONTAINING TETRACYANOETHANE COMPOUNDS

José Francisco Pazos, Claymont, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 20, 1976, Ser. No. 752,618

Int. Cl.² G03C *1/68, 5/00;* **C08F** *8/18*

U.S. Cl. 96—115 P **17 Claims**

1. A photohardenable coating composition which comprises

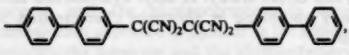
a. a substantially solid, organic composition comprising an addition polymerizable, nongaseous, ethylenically unsaturated compound capable of forming a high polymer by free-radical initiated chainpropagating addition polymerization, and a macromolecular, organic, polymeric binder.

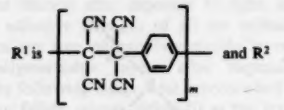
b. 1.0–10% by weight, based on the total solvent-free coating, of an organic, radiation-sensitive free-radical generating system activatable by actinic radiation which initiates polymerization of the unsaturated compound, and

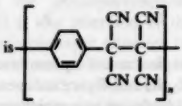
c. 0.04–3% by weight, based on the total solvent-free coating, of a tetracyanoethane compound of the formula

$$R^1C(CN)_2C(CN)_2R^2$$

where R^1 and R^2 are both p-chlorophenyl or p-biphenyl, or R^1 is p-biphenyl and R^2 is

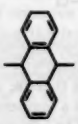






where m and n represent the number of repeat units, or R^1 and R^2 are joined together to form the $-CH(OC_2H_5)CH_2-$ radical, or

R^1 and R^2 are joined together to form the



radical.

4,050,942

NITROSO-DIMER-CONTAINING COMPOSITIONS AND PHOTOIMAGING PROCESS

George Raymond Nacci, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 560,711, March 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 452,338, March 18, 1974, abandoned. This application May 21, 1976, Ser. No. 688,931

Int. Cl.[2] G03C 1/70, 1/727

U.S. Cl. 96—115 R 17 Claims

1. A photopolymerizable coating composition which comprises

1. at least one, nongaseous, ethylenically unsaturated compound capable of forming a high polymer by free-radical initiated chain addition propagation,
2. 3–95% by weight, based on the total composition, of an organic polymeric binder having a molecular weight of at least 4000,
3. 0.1–5% by weight, based on the total composition, of a nitroso dimer which is a noninhibitor of free-radical polymerization but thermally dissociates to nitroso monomer which is an inhibitor of free-radical polymerization, and is characterized by
   a. a dissociation constant of 10^{-2} – 10^{-10} in solution at 25° C, and
   b. a rate of dissociation having a half-life of at least 30 seconds in solution at 25° C; and
4. 0.1 – 0.9% by weight, based on total composition, of an organic, radiation-sensitive free-radical generating system.

12. A method for producing an image on a substrate by the process which comprises

a. applying to the substrate a layer of a photopolymerizable coating composition which comprises
   1. at least one, nongaseous, ethylenically unsaturated compound capable of forming a high polymer by free-radical initiated chain addition propagation,
   2. 3–95% by weight, based on the total composition, of an organic polymeric binder having a molecular weight of at least 4000,
   3. 0.1–5% by weight, based on the total composition, of a nitroso dimer which is a noninhibitor of free-radical polymerization but thermally dissociates to nitroso monomer which is an inhibitor of free-radical polymerization, and is characterized by
      a. a dissociation constant of 10^{-2} – 10^{-10} in solution at 25° C, and
      b. a rate of dissociation having a half-life of at least 30 seconds in solution at 25° C, and
   4. 0.1 – 2% by weight, based on total composition, of an organic radiation-sensitive free-radical generating system, with the proviso that when the amount of free-radical generating system is 1–2%, the weight ratio of nitroso dimer to free-radical generating system is greater than 2 to 1,
b. imagewise exposing the photopolymerizable layer through an image-bearing transparency at a temperature of 20°–65° C to radiation which activates the free-radical generating system to generate free-radicals, whereby the free-radicals are consumed by reaction with the nitroso monomer,
c. essentially completely deactivating the nitroso dimer inhibitor system,
d. reexposing at least the previously unexposed portion of the photopolymerizable layer to radiation which activates the free-radical generating system to generate free-radicals while continuing to maintain the nitroso dimer inhibitor system in the essentially completely deactivated state, whereby photopolymerization takes place, and
e. developing the resulting image.

4,050,943

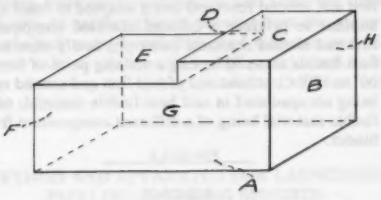
TREATMENT MATERIAL AND METHOD FOR EXPOSED AGGREGATE CONCRETE CASTING

Ratanjit S. Sondhe, c/o H.S.H. Enterprises, Inc. 10643-B Kinsman Road, Newbury, Ohio 44065

Continuation-in-part of Ser. No. 322,065, Jan. 8, 1973, abandoned. This application Mar. 5, 1975, Ser. No. 555,353

Int. Cl.[2] C08L 1/28

U.S. Cl. 106—12 9 Claims



1. A composition for preventing the setting of concrete comprising by weight from 3% to 10% of a film former dissolved in from 84.5% to 95% of an aliphatic alcohol having 1 to 3 carbon atoms, and from 2% to 5.5% of a chelating compound; wherein said film former is a cellulose ether of the type which is soluble in both water and said aliphatic alcohol; and wherein said chelating compound is selected from the group consisting of citric, tartaric, and gluconic acids, the sodium and calcium salts of these acids, and mixtures thereof.

4,050,944

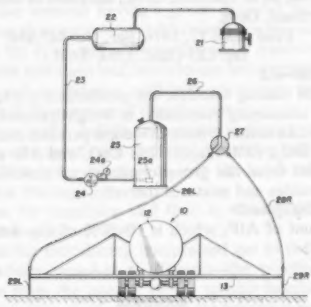
GROUND MARKING FOAM

Dwayne L. Cartwright, Dallas, Tex., assignor to Holloway Farm Supply, Inc., Whitewright, Tex.

Filed Feb. 23, 1976, Ser. No. 660,765

Int. Cl.[2] B01J 13/00

U.S. Cl. 106—19 7 Claims



1. A composition effective for producing an agricultural ground marking foam by passing air therethrough, comprising a concentrate to be further extended with water in the ratio of about 1 part concentrate to 80 parts water, by volume; said concentrate consisting essentially of:

sodium lauryl sulfate functioning as a foam producing ingredient; said foam producing ingredient comprising of 5 to 12 percent of the concentrate by weight;

n-lauryl betaine functioning as a foam stabilizer; said foam stabilizer comprising 1 to 10 percent of said concentrate by weight;

and water functioning as a diluent; said diluent comprising 70 to 90 percent of said concentrate by weight.

4,050,945

HEAT-SENSITIVE COLOR-PRODUCING COMPOSITIONS AND ARTICLES USING SAME

Yoshio Suzuki, 2-1438 Owada-cho, Omiya, Saitama, Japan

Filed July 8, 1974, Ser. No. 486,299
Int. Cl.[2] C09D *11/02, 11/12*
U.S. Cl. 106—21 9 Claims

1. A heat sensitive recording member comprising:

a uniform mixture of a first metallic compound reactant, a second chelating compound reactant and a binder, said first and second reactants being adapted to react with one another to produce a colored chelated compound, said first and second reactants being physically separated by a heat-fusible material having a melting point of from about 60° to 150° C, at least one of said first and second reactants being encapsulated in said heat-fusible material, said heat-fusible material being of a different composition from said binder.

4,050,946

GLASSES, THERMALLY STABLE HIGH (BETA)-CRISTOBALITE GLASS-CERAMICS AND METHOD

Chi-Tang Li, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 320,788, Jan. 3, 1973, abandoned. This application Oct. 22, 1976, Ser. No. 734,911
Int. Cl.[2] C03C *3/22, 3/04*
U.S. Cl. 106—39.6 13 Claims

1. A glass-ceramic having stabilized high-cristobalite solid solution crystal phase formed by thermal in situ crystallization of a glass consisting essentially of the composition $MO.Al_2O_3.nSiO_2$ wherein the Al_2O_3/MO molar ratio is 1 and MO is a member of the group consisting of CaO and a mixture of CaO and a metal oxide wherein the metal is a cation selected from iron and the first, second and fourth groups of the Periodic Table and the molar ratio of CaO to said metal oxide is from 4:1 to 1:3 and n is a positive number of from 8 to 37.

4,050,947

PROCESS FOR OPALIZING GLASS

Raymond E. Ahlgren; Danial W. Schwoerer, and Boyce H. Lundstrom, all of Portland, Oreg., assignors to Bullseye Glass Co., Portland, Oreg.

Filed Mar. 17, 1976, Ser. No. 667,494
Int. Cl.[2] C03C *3/04, 3/08*
U.S. Cl. 106—52 6 Claims

1. A glass making batch for the production of a spontaneous opal glass containing essentially, in weight percent, of:

40–85% of a cullett which, in weight percent, contains about 72% SiO_2, 13% Na_2O, 12% CaO, and 3% metal oxide selected from the group consisting of aluminum oxides, iron oxides and mixtures thereof;

3–19% SiO_2; and

an amount of AlF_3 which is 10–30% of the weight of the cullett.

4,050,948

METHOD OF MAKING LIGHTWEIGHT CEMENT SLURRIES AND THEIR USES

Richard G. Gandy, Grand Prairie, and Vincent Cohee White, Arlington, both of Tex., assignors to BJ-Hughes Inc., Long Beach, Calif.

Filed Mar. 23, 1976, Ser. No. 669,587
Int. Cl.[2] C04B *7/35*
U.S. Cl. 106—76 7 Claims

1. A method of making lightweight cement slurry capable of setting to provide a lightweight set cementitious composition, the method consisting essentially of

forming a solution of sodium metasilicate and an activator in mix water and, thereafter, mixing Portland cement and said solution to provide a cement slurry, the proportions of said solution and said Portland cement being selected to provide a slurry having a density of about 11 to 14 pounds per gallon of slurry, and wherein the amount of said sodium metasilicate is from about 1% to 3% by weight of the weight of said Portland cement, and the amount of said activator is from about 1% to 3% by weight of the weight of said Portland cement.

4,050,949

REINFORCING MATERIAL FOR CONCRETE

Bengt G. S. Lundgren, Ulricehamn, and Sture B. G. Ostling, Partille, both of Sweden, assignors to SKF Nova AB, Gothenburg, Sweden

Filed Nov. 24, 1975, Ser. No. 634,319
Claims priority, application Sweden, Nov. 26, 1974, 7414809
Int. Cl.[2] B22D *23/08*; C04B *31/18*
U.S. Cl. 106—97 12 Claims

1. A reinforcing material for concrete said material being a multitude of short and substantially straight steel reinforcing elements of substantially rectangular cross section and small thickness in relation to their length and width, intended to be uniformly distributed and randomly orientated in the concrete, characterized in that the elements are relatively difficult to crush steel flakes with a shape tapering towards the ends of the flakes, said flakes having a thickness of from about 0.1 mm to about 0.5 mm and a length of at least about 100 times the thickness.

4,050,950

CONTROLLED DENSITY FILL MATERIAL CONTAINING FLY ASH

William E. Brewer, Toledo, Ohio, and Franklin V. Zimmer, Southfield, Mich., assignors to K-Krete, Inc., Toledo, Ohio

Division of Ser. No. 475,579, June 3, 1974. This application Dec. 3, 1975, Ser. No. 637,463
Int. Cl.[2] C04B *13/22*
U.S. Cl. 106—97 11 Claims

1. A controlled density fill material consisting essentially of 2% to 6% by weight of Portland cement, 2% to 10% by weight of fly ash, 70% to 90% by weight of aggregate and 5% to 15% by weight of water, the fill material being sufficiently placeable and flowable that tamping or vibrating is unnecessary and having a concrete-comparison 28-day compressive strength of less than 1400 psi, whereby the material may be easily re-excavated.

4,050,951

PROCESS FOR THE POST-TREATMENT OF TITANIUM DIOXIDE PIGMENTS

Luigi Piccolo; Benedetto Calcagno, both of Milan, and Emilio Bossi, Fagnano Olona (Varese), all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Dec. 5, 1975, Ser. No. 638,161
Claims priority, application Italy, Dec. 20, 1974, 30816/74
Int. Cl.[2] C09C *1/36*
U.S. Cl. 106—300 14 Claims

1. A method for the post-treatment of titanium dioxide pigments, which comprises flowing in an elongated tubular reaction zone a suspension of subdivided particlces of titanium dioxide of a size from about 0.1 to 1 micron in a stream of carrier gas in which particle concentration is from 5 to 50 Kg per m^3 of carrier gas at a temperature of from 100° to 250° C, injecting into said stream at one or more points along said

tubular reaction zone a gaseous flow of one or more halides selected from the group consisting of the halides of aluminum, silicon and titanium in an overall amount corresponding to from 1 to 20% by weight, calculated as oxides, with respect to the feed in titanium dioxide, and injecting, downstream of each point of injection of said gaseous flow at a distance from the latter sufficient to allow the homogenization of the resulting mixture therein, a flow of steam in said mixture in an amount of from the stoichiometric value required for the transformation into hydroxides of said halides injected at said point to 50% in excess with respect to said stoichiometric value.

4,050,952

METHOD OF PRESERVING HONEY

David Edmund Liebl, 1136 Drake St., Madison, Wis. 53715

Filed Nov. 19, 1976, Ser. No. 743,527
Int. Cl.² A23L *1/08*
U.S. Cl. 127—46 R **1 Claim**

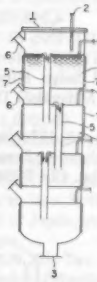
1. A method for (preserving) treating honey which comprises exposing the honey to (ultrasonic sound, 18,000–20,000 Hertz or higher, to inhibit crystallization and fermentation of the honey) ultrasound radiation of at least 18,000 Hertz in a temperature range of 50° to 100° Fahrenheit for less than 5 minutes whereby crystallization and fermentation of the honey are inhibited.

4,050,953

PROCESS FOR CONTINUOUSLY PRODUCING SUGAR

Norio Nakazato; Kosai Hiratsuka, and Tokinobu Furukawa, all of Kudamatsu, Japan, assignors to Hitachi, Ltd., Japan

Filed June 21, 1976, Ser. No. 698,080
Claims priority, application Japan, June 24, 1975, 50-76903
Int. Cl.² C13F *1/02*; C13G *1/00*
U.S. Cl. 127—60 **7 Claims**



1. In a process for continuously producing sugar from an aqueous sugar solution in a continuous sugar evaporator-crystallizer having a plurality of evaporating-crystallizing vessels, each evaporating-crystallizing vessel being a stage, each stage communicated one to another in series and provided with a means for feeding an aqueous sugar solution, a heating means and a means for withdrawing generated steam, by feeding the aqueous sugar solution to each evaporating-crystallizing stage, heating the aqueous sugar solution in each evaporating-crystallizing stage, thereby evaporating water from the solution and crystallizing sugar crystals, and withdrawing the generated steam from each of the stages, while feeding sugar crystals to the first evaporating-crystallizing stage and withdrawing the resulting sugar crystal slurry from the last evaporating-crystallizing stage, the improvement which comprises providing a sugar crystal distance of 0.26 to 0.59 mm in the solution in the first evaporating-crystallizing stage.

4,050,954

SURFACE TREATMENT OF SEMICONDUCTOR SUBSTRATES

Jagtar S. Basi, Fishkill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 25, 1976, Ser. No. 670,508
Int. Cl.² C03C *23/00*
U.S. Cl. 134—2 **13 Claims**

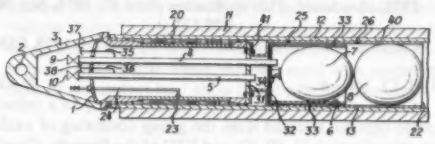
1. In a method of cleaning a silicon wafer polished with a metal oxide polishing medium, the improvement comprising: establishing hydrophilic surfaces on said wafer by oxidation thereof with an oxidizing agent selected from the group consisting of alkali metal hypohalites, and dichromates and permanganate salts of alkali metals in sulfuric acid, and including the step of treating the hydrophilic formed surfaces with an NH_4OH solution.

4,050,955

METHOD AND APPARATUS FOR LAUNCHING PIPELINE CLEARING SPHERES

Donald Alan Southgate, London, England, assignor to The British Petroleum Company Limited, London, England

Filed Apr. 1, 1975, Ser. No. 564,129
Claims priority, application United Kingdom, Apr. 10, 1974, 15912/74
The portion of the term of this patent subsequent to Mar. 15, 1994, has been disclaimed.
Int. Cl.² B08B *9/04*
U.S. Cl. 134—8 **3 Claims**



1. An underwater pipeline apparatus for closing an open end of a pipeline and for carrying and launching at least one pipeline clearing sphere for clearing the pipeline, said apparatus comprising in combination:

i. a tubular member having a given diameter for holding a pipeline clearing sphere and having an open end for inserting in the open end of a pipeline and a transverse closure opposite said open end, said closure being spaced from the open end a distance sufficient to permit the clearing sphere to be positioned therebetween;

ii. an outwardly radially expanisble gripping and sealing means associated with the tubular member and actuatable by a fluid under pressure to grip the inside of a pipeline and seal thereagainst;

iii. means for supplying said fluid to actuate said gripping and sealing means; and

iv. means for introducing compressed gas to the interior of the tubular member to displace the pipeline clearing sphere from the interior of the tubular member into the interior of the pipeline wherein the tubular member has an aperture in the wall thereof at a position so that gas can be released therethrough from the space between the location in the tubular member to be occupied by a spere and the transverse closure of the tubular member and the walls thereof, and means for admitting water to the interior of the space, whereby the water in said space acts to overcome sphere distortion when the apparatus is submerged.

3. A method of clearing a pipeline using a pipeline clearing apparatus which method comprises:

i. sucking a pipeline clearing sphere into a tubular member having a closed and open end by partly evacuating the member, said sphere and closed end defining a space therebetween;

ii. admitting water to, and releasing air from, the space

between the sphere and the closed end of the tubular member whereby the admitted water in said space acts to overcome sphere distortion when the apparatus is submerged;

iii. inserting the open end of the tubular member in the open end of a submerged pipeline;

iv. sealingly engaging the open end of the tubular member to the pipeline; and

v. supplying compressed gas to the space between the sphere and the closed end to displace the sphere into the pipeline and along the inside thereof to thereby clear the pipeline.

4,050,956

CHEMICAL BONDING OF METALS TO CERAMIC MATERIALS

Henderikus Johannes de Bruin, Bellvue Heights, and Charles Edward Warble, Glen Waverley, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell and The Flinders University of South Australia, Bedford Park, both of Australia

Continuation-in-part of Ser. No. 360,848, May 16, 1973, abandoned, which is a continuation of Ser. No. 117,511, Feb. 22, 1971, abandoned. This application June 18, 1975, Ser. No. 588,171

Claims priority, application Australia, Feb. 20, 1970, 0390/70

Int. Cl.[2] C23F *7/00*

U.S. Cl. 148—6 **26 Claims**

1. A method for chemically bonding a body of a refractory oxide ceramic selected from the group consisting of oxides of metals of groups II, III, IV and VIII of the Periodic Classification of the Elements and mixtures of such oxides, in chemical combination and physical admixture to the body of a metal selected from the group consisting of metals having atomic numbers between 21 and 29 inclusive in the first transition series between 39 and 47 inclusive in the second transition series and between 57 and 79 inclusive in the third transition series; the method comprising disposing selected surfaces of the bodies to be bonded in abutting relationship and heating at least the abutting surfaces in an atmosphere consisting of air to a temperature below the melting point of the lowest melting component of the system, the temperature sufficient to bring about a chemical reaction between the ceramic oxide and the metal thereby forming a bond between the said surfaces.

4,050,957

PROCESS FOR THE PASSIVATION OF FERROSILICON

Maurice Sales, Ville Longue, France, assignor to Societe Pyreneenne du Silico-Manganese, Paris, France

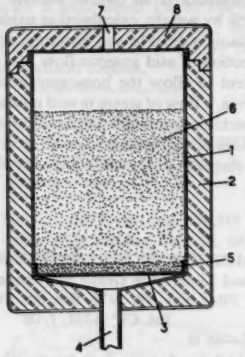
Continuation of Ser. No. 345,468, March 27, 1973, abandoned, which is a continuation of Ser. No. 52,879, July 7, 1970, abandoned. This application Oct. 8, 1975, Ser. No. 620,742

Claims priority, application France, July 10, 1969, 69.23581

Int. Cl.[2] C23C *11/00*

U.S. Cl. 148—6.3 **5 Claims**

1. A process for the passivation of discrete particles of ferrosilicon containing 30 to 90% by weight silicon comprising contacting said ferrosilicon particles with a gaseous oxidizing agent containing a gaseous inorganic acid, said gaseous oxidizing agent being selected from the group consisting of air, oxygen, steam or carbon dioxide, at a temperature between



about 800° and 1150° C for a period of time ranging between about one and twelve hours.

4,050,958

METHOD OF REMOVING SURFACE DEFECTS OF A STEEL PRODUCT

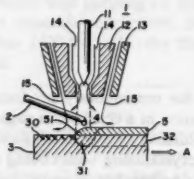
Wataru Shimada, and Seigo Hiramoto, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1976, Ser. No. 657,941

Claims priority, application Japan, Feb. 28, 1975, 50-25278

Int. Cl.[2] B23K *9/16*

U.S. Cl. 148—9.5 **4 Claims**



1. In a method of removing surface defects of a steel product by melting the defects of the surface with an arc, the improvement characterized by

using an arc generator which comprises a non-consumable electrode protected with an inert gas and means for shielding a molten pool formed on the surface of the steel product from air with a shield gas, comprising mainly carbon dioxide gas, and

applying a deoxidizer to the molten pool to deoxidize it and cover the surface of the molten pool with a slag formed therewith by the deoxidizer which is oxidized.

4,050,959

PROCESS OF MAKING A HIGH STRENGTH COLD REDUCED STEEL SHEET HAVING HIGH BAKE-HARDENABILITY AND EXCELLENT NON-AGING PROPERTY

Kazuhide Nakaoka; Kenji Araki, both of Yokohama; Koji Iwase, Machida; Yasuo Koike, Yokohama, and Shiro Fukunaka, Fukuyama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 14, 1975, Ser. No. 631,929
Claims priority, application Japan, Nov. 18, 1974, 49-132006
Int. Cl.[2] C21D *9/46*
U.S. Cl. 148—12.3 7 Claims

1. A process of making a high strength cold reduced steel having both high bake-hardenability and excellent non-aging property consisting essentially of controlling the chemical composition of the steel within the following range in the steel making stage:

C	0.02 to 0.12%
Mn	10 × [S] to 2.00%
[N] [N]	0.003 to 0.02%
Al	$<5 \times 10^{-4}$/[N] %
[S] [S]	0.005 to 0.023%,

the steel is hot rolled, pickled and cold reduced, and the cold-reduced steel strip so obtained is subjected to the following full continuous annealing process:

heating-up step	Ac_1 to 900° C.
holding time	5 to 180 seconds at a temperature of from Ac_1 to 900° C.
rapid cooling step	quenching to room temperature from Ac_1 to 900° C. in a water jet stream
reheating step	from the room temperature to a temperature of from 150 to 450° C.
tempering step	holding at a temperature of from 150 to 450° C. for from 5 to 300 seconds, and
final step	cooling from 150 to 450° C. to room temperature and coiling.

4,050,960

METHOD FOR DECREASING THE AMOUNT OF CARBON AND NITROGEN CONTAINED IN THE FERROCHROME ALLOY

Yasushi Nakamura; Michihisa Itou, both of Tokyo, and Mitsuo Uchimura, Yokohama, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 531,218, Dec. 10, 1974, abandoned.
This application June 7, 1976, Ser. No. 693,621
Claims priority, application Japan, Dec. 11, 1973, 48-137372
Int. Cl.[2] C21D *1/74;* C22F *1/02*
U.S. Cl. 148—16 4 Claims

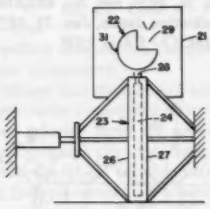
1. A method for decreasing the carbon and nitrogen content of pulverized ferrochrome alloy which comprises pulverizing a molten bath of the ferrochrome alloy having a carbon content of 0.1% or less in an atomizing operation by the use of a jet of a cooling water to produce ferrochrome alloy particles of a size of 1 mm to 0.05 mm and further under such condition as to generate an oxide film of 1 μ or less on the surface of said particles, said water containing oxygen dissolved therein of 1.5 ml or less per 1 l of the water at 20° C, the atmosphere in which the atomizing operation is effected being maintained at 5% or less oxygen, and thereafter heating the particles in a hydrogen stream at a temperature between 1000° C and 1300° C for about 3 to 20 hours to cause carbon in the alloy to react with the oxide film on the surface of said particles whereby the carbon is removed from said particles, nitrogen being removed by said hydrogen stream.

4,050,961

METHOD FOR CASTING ANODES

Bill J. Knight, 7315 S. Settler Ave., Tucson, Ariz. 85706

Filed Nov. 22, 1974, Ser. No. 526,161
Int. Cl.[2] B22D *25/04, 35/04*
U.S. Cl. 148—32 23 Claims



1. In a method of casting an insoluble anode including the steps of heating a lead alloy to a molten condition and pouring the molten lead alloy into a suitable mold, the improvement comprising the additional steps of

arranging the mold in a vertical configuration and providing an opening along the entire length of the mold for introducing molten lead alloy thereinto,

selecting the temperature of the molten lead alloy at a predetermined differential above its melting point,

maintaining the temperature of the mold at a predetermined temperature substantially below the melting point, and

thereafter continuously streaming the molten lead alloy into various distinct portions of the opening; proportionately along substantially its entire length in order to achieve intimate and complete filling of the mold with minimum flow of the molten lead alloy thereby being necessary.

4,050,962

MANUFACTURE OF FERROMAGNETIC, ACICULAR METALLIC IRON PARTICLES BY HYDROGEN REDUCTION

Eberhard Koester, Frankenthal; Gerd Wunsch, Speyer; Eduard Schoenafinger, Ludwigshafen, and Henning Schneehage, Mutterstadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed July 14, 1975, Ser. No. 595,562
Claims priority, application Germany, July 16, 1974, 2434096
Int. Cl.[2] H01F *1/02*
U.S. Cl. 148—105 8 Claims

1. A process for the manufacture of acicular ferromagnetic iron metal particles which comprises the steps of:

a. dispersing acicular iron oxide in a solution of an alkaline earth metal salt in a solvent wherein the alkaline earth metal cation of said metal salt is selected from the group consisting of calcium, barium and strontium, and the acid anion of said metal salt is selected from the group consisting of aliphatic monobasic, dibasic and tribasic carboxylic acid anions of from 2 to 6 carbon atoms;

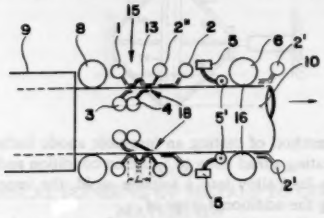
b. removing the solvent by evaporation, said alkaline earth metal salt being applied to said acicular iron oxide in an amount of from 0.2 to 10% by weight based on the iron oxide employed; and

c. reducing the so-treated pulverulent acicular iron oxide by passing gaseous hydrogen at a temperature of from 230 to 350° C over said treated iron oxide to form acicular iron metal particles retaining the acicular shape of the acicular iron oxide starting material and being from 0.1 to 0.6 μm in length with a length-to-thickness ratio of from 10 to 25:1.

4,050,963
METHOD OF QUENCHING LARGE-DIAMETER THIN-WALL METAL PIPE

Kazuo Kunioka, Yokohama; Yutaka Mihara, Tokyo, and Takao Noguchi, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1976, Ser. No. 652,576
Claims priority, application Japan, Jan. 31, 1975, 50-12380
Int. Cl.[2] C21D 9/08
U.S. Cl. 148—128 **8 Claims**



1. A method of quenching a large-diameter thin-walled metal pipe comprising the steps of:

moving the metal pipe through a heating zone;

passing the pipe through a cooling zone following passage of the pipe through the heating zone, the cooling zone including a plurality of nozzles;

spraying a cooling liquid onto the pipe from the nozzles so as to quench the pipe at a velocity in the range of from 0.5 m/sec to 7 m/sec;

detecting the amount of strain on the outer periphery of the quenched pipe in a radical direction at a plurality of positions at the rear end of the cooling zone, as seen in the direction of movement of the pipe, to obtain a deviation of a detected value from a preset value; and

adjusting the amount of cooling liquid sprayed on the pipe from the nozzles in accordance with the amount of deviation from the preset value, whereby the adjusted cooling water spray controls the deviation of the pipe emerging from the cooling zone.

4,050,964
GROWING SMOOTH EPITAXIAL LAYERS ON MISORIENTED SUBSTRATES

Daniel Leon Rode, Murray Hill, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 636,564, Dec. 1, 1975, abandoned. This application Feb. 23, 1976, Ser. No. 660,472
Int. Cl.[2] H01L 21/208, 21/205
U.S. Cl. 148—171 **8 Claims**

1. A process of epitaxially depositing semiconductor material on a semiconductor substrate comprising the step of misorienting the growth surface from a crystallographic plane of the substrate by an angle approximately equal to the angle between the treads and risers of terraces which would be formed at the growth temperature if the epitaxial layer were deposited on a surface nominally parallel to said plane

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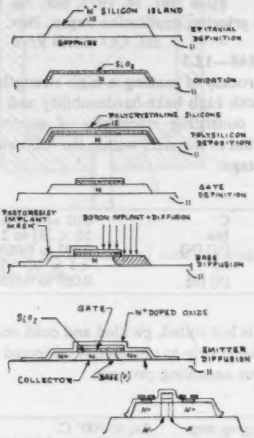
4,050,965
SIMULTANEOUS FABRICATION OF CMOS TRANSISTORS AND BIPOLAR DEVICES

Alfred C. Ipri, Princeton, N.J., and John C. Sarace, Mission Viejo, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 21, 1975, Ser. No. 624,515
Int. Cl.[2] H01L 21/84, 21/265
U.S. Cl. 148—175 **1 Claim**

1. A process for the fabrication of a bipolar device being comprised of forming a dielectric substrate of sapphire, depositing an epitaxial layer of semiconducting material thereupon in a single crystal fashion, forming semiconductor islands by an etching technique leaving regions of material where the bipolar device is to be formed, oxidizing the formed semiconductor islands, depositing poly-crystalline silicon thereupon, defining the deposited poly-crystalline silicon, base doping the bipolar device on one side of the device, diffusing the base doping, N+ doping for the emitter of the bipolar device with the edge



of the formed poly-silicon gate being the diffusion edge for both the base and emitter diffusion, the N+ doping also making better contact to the collector region, as well as for source-drain n-channel device doping, P+ doping for "p" channel source drain, base contacting, driving in diffusion sources N+ and P+, opening contacts, and forming metal interconnects to complete the circuit.

4,050,966
METHOD FOR THE PREPARATION OF DIFFUSED SILICON SEMICONDUCTOR COMPONENTS

Rudolf Wolfle, Gilching; Dieter Rucker, Hohenschaftlarn, and Uta Lauerer, Neugermering, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Continuation of Ser. No. 884,616, Dec. 12, 1969, abandoned. This application June 19, 1975, Ser. No. 588,516
Claims priority, application Germany, Dec. 20, 1968, 1816082
Int. Cl.[2] H01L 21/228
U.S. Cl. 148—188 **3 Claims**

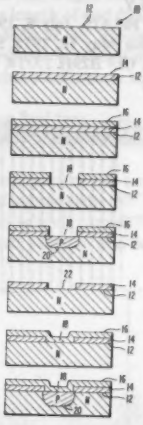
1. In a method of preparing semiconductor components of silicon having at least two zones of different conduction type produced by diffusion from dopant-containing solid substance applied to the surface of a semiconductor crystal, the solid substance being at least one layer of nickel substantially 0.2 μ thick and containing a concentration of from 3 to 10 percent of respective dopant, the nickel layer including the dopant contained therein being deposited chemically upon selected zones of the semiconductor crystal surface, and the dopant at the selected zones being diffused into the respective zones from a respective layer of nickel containing the dopant to form zones of different conduction type, the improvement therein which comprises carrying out the diffusion of the dopant into the semiconductor crystal in two steps which consist of diffusing a series of disks formed of semiconductor crystal and separated by respective spacers until a liquid phase is no longer present at the respective surface of the crystal disks, and thereafter removing the spacers and packing the crystal disks tightly against one another and completing the diffusion thereof.

4,050,967

METHOD OF SELECTIVE ALUMINUM DIFFUSION

Wojciech Rosnowski, Summit, and Samuel Ponczak, Somerville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 9, 1976, Ser. No. 749,179
Int. Cl.[2] H01L *21/223, 21/225*
U.S. Cl. 148—189 10 Claims



1. A method of selectively diffusing aluminum into a wafer including a silicon body having a surface comprising:

forming a masking layer comprising a layer of silicon dioxide and a layer of polycrystalline silicon on a surface of said body;

forming an opening in at least one of said layers thereby defining a masked portion and an unmasked portion of said surface;

subjecting said wafer, including both the unmasked portion of said surface and said masked portion to a source of aluminum impurities; and

diffusing said aluminum through said opening and into said body.

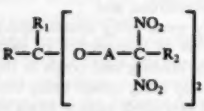
4,050,968

EXPLOSIVE COMPOSITION CONTAINING A HYDROXYALKYL ACRYLATE COPOLYMER BINDER

Samuel Goldhagen, Sacramento, Calif.; Harry Heller, Silver Spring, Md., and Julius Rothenstein, Citrus Heights, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 29, 1970, Ser. No. 29,623
Int. Cl.[2] C06B *45/10*
U.S. Cl. 149—19.4 16 Claims

1. A cured explosive composition comprising (1) an explosive, (2) a readily curable elastomeric polymer which is derived from 2,2-dinitropropyl acrylate and at least one hydroxy alkyl acrylate; (3) a diluent or plasticizer selected from the group consisting of diluents or plasticizers represented by the formula



wherein R is hydrogen or alkyl; R_1 is hydrogen or alkyl; R_2 is hydrogen, alkyl, halogen, nitroalkyl, aryl, cycloalkyl, haloalkyl or nitrazaalkyl; and A is alkylene; and (4) a polyisocyanate curing agent.

4,050,969

CATALYTIC SYSTEM AND POLYURETHANE PROPELLANTS

Adolf E. Oberth, Fair Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sept. 29, 1976, Ser. No. 727,723
Int. Cl.[2] C06B *45/10*
U.S. Cl. 149—19.4 4 Claims

1. In a propellant composition comprising:

a. an oxidizer component;

b. a polyurethane fuel component; and

c. the improvement comprising as a curing catalyst a ferric compound selected from the group consisting of ferric bis(acetylacetonato) chloride, ferric bis (acetylacetonato) perchlorate, ferric bis (acetylacetonato) mandalate, and ferric bis (acetylacetonato) p-toluenesulfonate.

4,050,970

STABILIZED NITRATO-ALKANOL EXPLOSIVE COMPOSITION

George Henry Barnett, Kew, Australia, assignor to ICI Australia Limited, Melbourne, Australia

Filed Nov. 21, 1975, Ser. No. 634,179
Claims priority, application Australia, Dec. 9, 1974, 9949/74
Int. Cl.[2] C06B *25/00*
U.S. Cl. 149—88 19 Claims

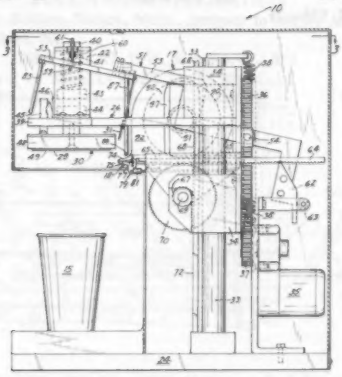
1. An aqueous composition of matter comprising at least one nitrato-alkanol and a stabilizingly effective amount of one or more derivatives of carbamic acid sufficient to maintain the pH of said aqueous composition between about 4 and about 8.

4,050,971

DEVICE FOR FUSING LENGTHS OF FILM OVER THE OPEN ENDS OF CUPS

Wayne R. Verkins, St. Anthony; Richard T. Podvin, Fridley, and Karl Frederick Rist, III, Oakdale, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 19, 1976, Ser. No. 659,234
Int. Cl.[2] B65B *7/00*
U.S. Cl. 156—69 10 Claims



1. A device for applying predetermined lengths of a heat sealable film over the open end of a cup from a supply length of the film, said device comprising:

clamp means comprising jaws having projecting terminal ends adapted for engagement with a said film, means mounting said jaws for relative movement between a closed position affording engagement of the terminal ends of the jaws on opposite sides of a said film and an open position at which the terminal ends of the jaws are spaced

to afford movement of a said film therebetween, and means for releasably retaining said jaws at either their open or closed positions;

means for advancing said clamp means from a first position to a second position, said positions being spaced a distance equal to said predetermined length;

means at said first position for moving said jaws from said open position to said closed position to afford engagement of said jaws with an end portion of a said film;

means at said second position for moving said jaws from said closed position to said open position to afford release of a said predetermined length of film upon application thereof to a said cup;

means adapted for supporting a said cup in said device;

means for providing relative movement between said means adapted for supporting and a said predetermined length of the film extending between said first and second positions, said means for providing relative movement being adapted to bring the lip of the cup into full circle engagement with one surface of the predetermined length of film;

means for applying heat and pressure to fuse said predetermined length of film to the lip of said cup when the predetermined length of film is in engagement with the cup; and

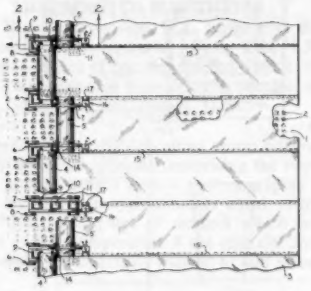
means for severing the applied predetermined length of film from the supply length of film.

4,050,972

LAYING DOWN OF LARGE SHEETS OF FILM

Daniel E. Cardinal, Jr., 1352 Estate Lane, Lake Forest, Ill. 60045

Filed Feb. 25, 1977, Ser. No. 772,305
Int. Cl.[2] B32B *31/08*
U.S. Cl. 156—71 **8 Claims**



6. A method of protecting a large field with a removable film sheet, said method comprising:

a. externally supporting on a transport assembly a plurality of short rolls of film in generally end-to-end but staggered relationship so that the ends of said rolls overlap,

b. driving said assembly in one direction down the field,

c. simultaneously rotating said rolls in one direction to thereby unwind said film in edge-to-edge overlapping relationship and lay it onto the field,

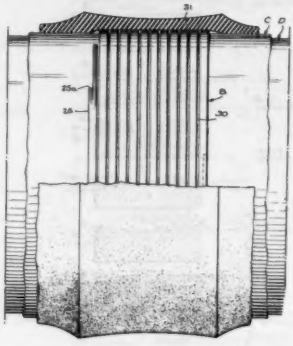
d. and joining the overlapping edges of said film as it is unwound so that it is laid down in a unitary sheet.

4,050,973

METHODS OF BUILDING ZERO DEGREE BELTED TIRES, USING HIGH SOFT STRETCH BELT-FORMING TAPES

James J. Neville, Kinnelon; Wesley Ferrell, Wayne, and Daniel Schichman, Cedar Grove, all of N.J., assignors to Uniroyal Inc., New York, N.Y.

Division of Ser. No. 160,675, July 8, 1971, Pat. No. 3,774,662.
This application May 10, 1973, Ser. No. 359,191
Int. Cl.[2] B29H *17/14, 17/20*
U.S. Cl. 156—123 R **13 Claims**



1. The method of single-stage building a raw 0° belted tire; said method comprising the steps of:

A. building on a tire building drum a tire carcass having at least in the medial region thereof a building diameter substantially less than the ultimate diameter of the corresponding crown region of the toroidally shaped carcass; and

B. building on said medial region of said as built carcass while the latter is maintained substantially at said building diameter a circumferentially extending reinforcing cord-constituted 0° belt-forming structure having

1. a high radial expansibility and

2. no circumferentially adjacent laterally directed cut cord ends along either side edge;

C. the building of said 0° belt-forming structure comprising the steps of

1. providing high "soft stretch" reinforcing cord tape constituted of

a. a plurality of reinforcing cords disposed in side by side relation and

i. each having a respective multiplicity of undulations therein

ii. which in any given straight length of said tape are substantially planar, with the plane of each undulation in each cord being substantially parallel to the plane of the corresponding undulation in each next adjacent cord, and with said undulations in each cord being out of lateral alignment with said undulations of each next adjacent cord,

iii. and which undulations enable said tape to be elongated, without any stretching of said cords, by straightening of the latter to remove said undulations therefrom, and

b. relatively weak tying means acting on said cords at the regions of intersection of said undulations and releasably holding said cords in the undulating state thereof, said tying means being constructed

i. to hold said cords against straightening under moderate forces such as are applied to said tape during normal handling thereof and the building of said belt-forming structure,

ii. but to yield and permit said cords to straighten out under appreciably higher forces such as are applied

to said tape when said belt-forming structure composed thereof and said as built carcass undergo a radial expansion during shaping,

c. the magnitude of said undulations of said cords being predetermined to provide a tape stretch ratio, defined as the ratio of the length of said cords when fully straight to the length of said tape when said cords are undulated, which is no greater than substantially equal to the expansion ratio of the tire, defined as the ratio of said ultimate diameter to said building diameter; and

2. helically winding said tape

a. circumferentially of said as built carcass in said medial region thereof

b. for at least a plurality of full turns

c. at an angle of substantially 90° to a plane including the axis of said as built carcass

d. until the desired width of said belt-forming structure is attained.

4,050,974

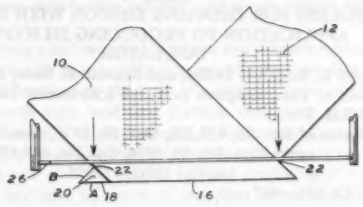
METHOD OF REDUCING INTERLINER REMNANT

Jules Borrin, 299 Sherman Ave., Teaneck, N.J. 07666

Filed Jan. 24, 1977, Ser. No. 761,979

Int. Cl.[2] B31F *5/00*; B32B *31/00*

U.S. Cl. 156—159 **7 Claims**



1. A method of reducing remnant upon the cutting of interliner blanks from a plurality of bias-cut strips of square-woven interlining material, which comprises:

providing first and second strips of a thermoplastic interlining material, bias-cut from a square-woven sheet, said strips having upper and lower planar surfaces bounded by parallel bias-cut side edges, parallel butt end edges and substantially the same widths;

superposing a portion of the lower surface of the first strip over a portion of the upper surface of the second strip with a portion of a butt end edge of said first strip superposed over a portion of a butt end edge of said second strip, said superposed butt end edges being aligned with each other and each aligned butt end edge of each strip extending distally beyond one bias-cut side edge of the opposite strip a given distance;

fusing the first and second strips together along a thin line traversing the width of said strips along a line parallel to said aligned butt end edges, a distance from said aligned butt end edges equal to the distance from the point where said bias-cut edge of one strip intersects with said bias cut edge of the other strip (point **22** in the drawings);

severing to remove the portion of said strips between said thin line and the aligned butt end edges; and

using the fused strips as a source of interliner blanks.

4,050,975

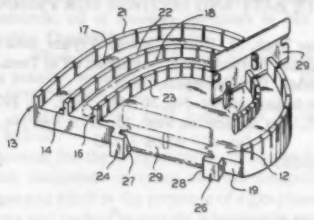
O-RING SPLICING FIXTURE

A. Peter Draffone, Lombard, Ill., assignor to B.W. Darrah, Inc., Chicago, Ill.

Filed Sept. 22, 1976, Ser. No. 725,419

Int. Cl.[2] B29C *19/00*

U.S. Cl. 156—217 **10 Claims**



10. The method of fabricating O-rings from flexible cord material comprising steps of:

cutting the desired cord material to a length slightly larger than the circumference of the O-ring required;

forming a spiral of the cut cord material;

keeping the spiral formed cut cord material in a single plane thereby conforming the cord material at the ends to the arcuate shape determined by the desired finished O-ring;

cutting the spiral formed cord material along the diametral plane at a point on the spiral where its arcuate shape conforms to the arcuate shape determined by the desired finished O-ring to form one end;

repositioning the cut cord materials into the spiral with the other end at the point in the spiral so that its arcuate shape conforms to the shape of the finished O-ring;

trimming the other end along the diametral plane at the same point on the spiral; and

bonding the one end and the other end together to complete the O-ring forming a perfect circle with uniform cross-sectional stress.

4,050,976

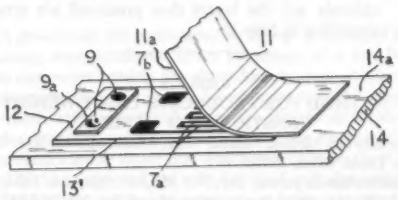
STRAIN GAGE APPLICATION

Ludvigs O. Reiters, Natick, Mass., assignor to Bofors America, Inc., Edison, N.J.

Filed Jan. 27, 1976, Ser. No. 652,894

Int. Cl.[2] B32B *31/00*, *15/08*

U.S. Cl. 156—233 **7 Claims**



1. In the preparation of a strain-gage, a method for application of fine electrically-conductive metallic foil grids in uncemented attachment to a specimen surface, comprising the steps of supporting a metallic foil grid upon a flexible backing, adhering the thus-supported grid to a tacky surface of a pressure-sensitive flexible tape, removing the backing, replacing the backing with a flexible layer less than about 0.001 inch thick and consisting essentially of a partly-cured fiber-reinforced thermosetting resin, placing and pressing the outer surfaces of the resin layer against a desired surface to which the grid is to be bonded while the tape and grid adhere, effecting a final curing of the resin layer which hardens the same while bond-

ing it both to the desired surface on one side and to the grid on the other, and stripping the tape to expose the grid after the resin layer is sufficiently hardened by curing to bond securely with the grid.

4,050,977

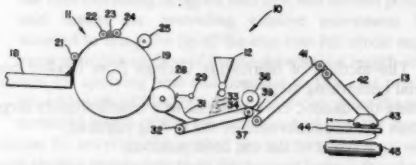
COMPOSITE BATT AND METHOD FOR PRODUCING SAME

George Sumner Buck, Jr.; Robert George Weyker, both of Memphis, and Arthur Gerard Ward, Arlington, all of Tenn., assignors to Fiberlok, Inc., Memphis, Tenn.

Continuation-in-part of Ser. No. 507,485, Sept. 19, 1974, Pat. No. 3,993,518. This application Sept. 12, 1975, Ser. No. 612,858

Int. Cl.² B32B *31/00*

U.S. Cl. 156—283 **3 Claims**



1. A process for producing a layered composite batt comprising the steps of:

A. Producing a plurality of open webs of fibers,

B. Dispensing a particulate copolymer onto each open web of fibers;

C. Reciprocatively layering each web and the particulate copolymer carried therein to form a layer having an upper and a lower face,

D. Arranging the layers thus formed such that each layer produced is in face to face contact with at least one other layer, thereby forming a plurality of layers,

E. Heating the plurality of layers to a temperature above the melting point of the copolymer but below the scorching point of the fibers, thereby bonding the layers into a composite, and

F. Allowing the composite to cool to room temperature.

wherein Steps A, B, and C are used to produce a layer of cotton fibers having dispensed therein a particulate copolymer of vinyl chloride and vinylidene chloride and Steps A, B, and C are used to produce a layer of polyester fibers having dispensed therein a second particulate copolymer of vinyl chloride and vinylidene chloride and the layers thus produced are arranged according to Step D.

4,050,978

METHOD FOR PRODUCING LIGHT-WEIGHT CONSTRUCTION MEMBER

Alvin Edward Moore, Manini Way, Diamondhead, Rte. 1, Bay St. Louis, Miss. 39520

Continuation-in-part of Ser. No. 359,800, May 14, 1973, Pat. No. 3,878,661, which is a continuation of Ser. No. 102,317, Dec. 29, 1970, abandoned. This application Apr. 21, 1974, Ser. No. 569,922

Int. Cl.² B32B *5/18*; B29D *27/00*; B28B *23/00*

U.S. Cl. 156—300 **6 Claims**

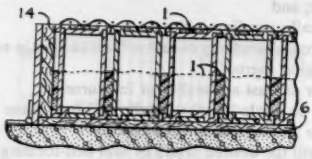
1. A method of making a light-weight, transportable construction member, including the following steps:

A. placing in the bottom of a mold that is later separable from said member a can-supporting, substantially planar, preformed can-supporting element;

B. placing on said can-supporting element a plurality of strength-providing cans, each of these cans having: a sidewall; a lower can-end element, fixed to the bottom of said sidewall and resting on the can-supporting element; and an upper can-end plate that has an upwardly open recess;

C. placing on said upper can-end plates strength-providing network, having mesh sufficiently large for passage of moldable material thru it; and providing means holding at least portions of said network in contact with upper can-end plates;

D. inserting into the mold, thru said mesh, moldable material in fluent form, capable of setting into can-bracing material



and adhering to said cans and said can supporting element, sidewall-bracing portions of said material going around and bracing said sidewalls, and extending above said lower can-end elements and not being above said upper can-end plates other portions of its lodging in said upwardly facing recesses, only that part of said material lodging in said upper can-end recesses extending above said upper can-end plates;

E. allowing said fluent material to set; and taking from the mold the completed construction member.

4,050,979

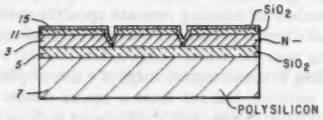
PROCESS FOR THINNING SILICON WITH SPECIAL APPLICATION TO PRODUCING SILICON ON INSULATOR

Ronald K. Smeltzer, Dallas, and Kenneth E. Bean, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 429,228, Dec. 28, 1973, abandoned. This application Jan. 14, 1976, Ser. No. 649,130

Int. Cl.² H01L *21/306*

U.S. Cl. 156—647 **9 Claims**



1. A method of forming thin layers of silicon on an insulating substrate which comprises the steps of

a. providing a silicon member having a first layer of one conductivity type and a second layer of opposite conductivity type and having a resistivity of at least an order of magnitude greater than said first layer and a concentration of less than about 1.5×10^{19} atoms/cc, and

b. forming a first oxide layer on said second layer,

c. forming a layer of polycrystalline silicon on said first oxide layer,

d. etching said first layer with an etching solution consisting of, by weight, 1 part HF, 3 parts NHO_3 and from about 8 to about 12 parts CH_3COOH to provide etching away of said first layer, said etching automatically stopping at the junction of said first and second layer, and

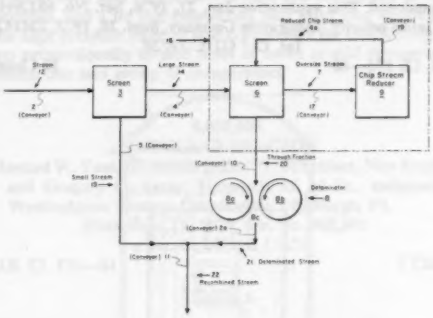
e. forming semiconductor devices in the exposed surface of said second layer.

4,050,980

SELECTIVE DELAMINATION OF WOOD CHIPS

Fred L. Schmidt, and Frank J. Steffes, both of Camas, Wash., assignors to Crown Zellerbach Corporation, San Francisco, Calif.

Continuation-in-part of Ser. No. 527,772, Nov. 27, 1974, abandoned. This application Mar. 15, 1976, Ser. No. 666,823
Int. Cl.[2] D21C *1/10*
U.S. Cl. 162—24 10 Claims



1. A selective delamination process for producing a high yield, uniform pulp having reduced pulp screen rejects, which comprises:

a. conveying a mill-wood chip stream to a primary means for separating by size the chip stream into respective first and second fractions on the basis of a chip thickness of about one-fourth inch, said first fraction consisting of wood chips having a thickness equal to or greater than about one-fourth inch and being retained by said primary separation means, and said second fraction consisting of wood chips having a thickness of less than about one-fourth inch;

b. conveying said first chip fraction to a means for reducing the size of said first chip fraction without imparting substantial compressive forces thereto and without substantial reduction in the fiber length of the chips in said first wood chip fraction;

c. conveying said reduced chip fraction to a secondary means for separating by size said reduced chip fraction into respective oversized and through-put chip fractions, the oversized chip fraction consisting of wood chips having a thickness equal to or greater than about one-fourth inch and being retained by said secondary separation means and said through-put fraction consisting of wood chips having a thickness of less than about one-fourth inch, said through-put fraction being more susceptible to liquor penetration during pulping than chips having a larger thickness;

d. reconveying said oversized chip fraction to said reducing means for further reduction of said oversized chips and reconveying said reduced chips produced thereby to said secondary separation means;

e. selectively delaminating said through-put fraction, at a substantially high through-put rate, by feeding same to a compression means; and

f. pulping said second chip fraction and said selectively delaminated fraction, respectively to produce wood pulp.

4,050,981

PROCESS FOR THE DELIGNIFICATION OF LIGNOCELLULOSIC MATERIAL BY MAINTAINING A CONCENTRATION OF CARBON MONOXIDE IN THE PRESENCE OF OXYGEN AND ALKALI

Allan Geoffrey Jamieson, Ornskoldsvik; Hans Olof Samuelson, Goteborg; Leif Åke Smedman, Domsjo, and Kent Ivar Sondell, Ornskoldsvik, all of Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Filed June 11, 1975, Ser. No. 586,114
Claims priority, application Sweden, June 14, 1974, 7407885; Jan. 22, 1975, 7500686
Int. Cl.[2] D21C *3/02, 9/02, 9/14, 11/06*
U.S. Cl. 162—37 37 Claims

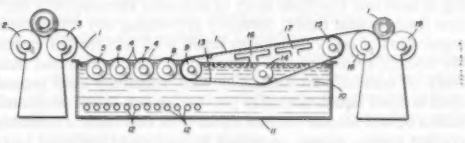
1. A process for the delignification of lignocellulosic material which comprises carrying out the delignification with oxygen gas and alkali in the presence of a gas phase comprising oxygen gas and carbon monoxide wherein the carbon monoxide is in a concentration within the range from about 1% to about 12% by volume of the gas phase while maintaining the carbon monoxide concentration within said range by withdrawing carbon monoxide and oxygen gas from the delignification, and separating and recycling withdrawn oxygen gas.

4,050,982

PROCESS AND APPARATUS FOR CONTINUOUSLY SHRINKING A NON-WOVEN SHEET

Robert Bolliand, Lyon, and Claude Saligny, Ecully, both of France, assignors to Rhone-Poulenc-Textile, France

Filed Apr. 16, 1974, Ser. No. 461,341
Claims priority, application France, May 18, 1973, 73.18439
Int. Cl.[2] D21D *3/00*
U.S. Cl. 162—100 5 Claims



1. A process for the continuous shrinking of a sheet of fibers containing heat-shrinkable fibers by means of a hot liquid, which comprises passing the sheet loosely over at least one cylinder partially immersed in a liquid maintained at a temperature which will cause shrinkage of the shrinkable fibers, said cylinder having a surface exposed above the liquid which is coated with a stable liquid film which prevents the sheet from touching the surface of the cylinder, said cylinder being rotated in the direction the sheet travels, and removing absorbed liquid from the sheet.

2. An apparatus for shrinking a sheet which contains heat-shrinkable fibers which comprises a tank containing a liquid heated at a temperature which will cause shrinkage of the shrinkable fibers at a constant level, at least one cylinder rotatably disposed in the tank with a surface exposed above the level of the liquid, means for rotating the cylinder at a speed whereby a continuous, stable liquid film is carried on the exposed surface thereof, said film covering the sheet without it touching the surface of the cylinder, means for putting the sheet loosely into contact with the film carried by the cylinder in the same direction as the cylinder is rotated, and means for removing liquid from the sheet.

4,050,983

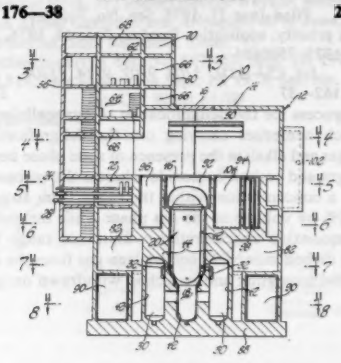
PASSIVE CONTAINMENT SYSTEM

Frank W. Kleimola, Jackson, Mich., assignor to Nucledyne Engineering Corporation, Reed City, Mich.

Continuation-in-part of Ser. No. 383,485, July 30, 1973, Pat. No. 3,984,282, which is a continuation of Ser. No. 61,063, Aug. 5, 1970, abandoned. This application Feb. 10, 1975, Ser. No. 548,744

Int. Cl.[2] G21C 9/00

U.S. Cl. 176—38 20 Claims



1. In a boiling water type nuclear reactor power plant comprising a reactor assembly wherein said reactor assembly serves as steam generating means for driving associated turbine means, reactor assembly coolant system means comprising reactor coolant conduit means, reactor coolant circulated within at least a portion of said reactor assembly coolant system means, and a containment structure sealingly enclosing at least said reactor assembly and at least a portion of said reactor assembly coolant system means, the method of affecting containment of said reactor power plant during a failure of said reactor assembly coolant system means within said containment structure and an attendant vaporized loss of said reactor coolant therefrom, said method comprising the steps of providing at least one first fluid body of normally kinematically inert first fluid coolant liquid, normally preventing any direct communication of said first coolant liquid with said reactor assembly coolant system means, providing at least one second fluid body of normally kinematically inert relatively cold second fluid coolant liquid, normally preventing any direct communication of said second coolant liquid with said reactor assembly coolant system means, providing at least one third fluid body of normally kinematically inert relatively hot third fluid coolant liquid, normally preventing any direct communication of said third coolant liquid with said reactor assembly coolant system means, permitting said reactor coolant as is accidentally lost from said failure to enter into a void space defined by said containment structure and vaporize within said void space to thereby increase the pressure within said void space, permitting sufficient quantities of such accidentally lost reactor coolant to enter and vaporize within said void space as to cause said pressure within said void space to increase to a first predetermined magnitude, when said pressure of said vaporized reactor coolant attains said first predetermined magnitude permitting at least a portion of said second coolant liquid and said third coolant liquid to be communicated to said reactor assembly coolant system means as to thereby at least in part replace the volume of said reactor coolant lost therefrom due to said failure, permitting at least a portion of said vaporized reactor coolant in said void space to flow through said first coolant liquid to thereby cause said first coolant liquid through heat transference to absorb some of the energy of said vaporized reactor coolant flowing therethrough, and permitting said vaporized reactor coolant to continue to flow into said first coolant liquid to thereby result in at least substantial displacement of said first coolant liquid and an attendant flow of said first coolant liquid into said void space whereby a back pressure of sufficient magnitude is developed within said void space sufficient to prevent further depletion of said reactor coolant from said reactor assembly coolant system means through said failure.

4,050,984

CLOSED CYCLE GAS COOLANT NUCLEAR POWER PLANT

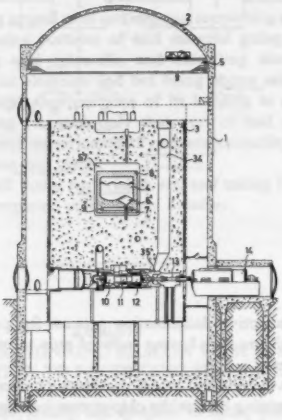
Erhard Arndt, Viernheim; Nikolaus Brodmann, Unterflockenbach, and Horst R. Roser, Hemsbach-Entenweide, all of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Cologne, Germany

Continuation-in-part of Ser. No. 391,018, Aug. 23, 1973, abandoned. This application Jan. 27, 1976, Ser. No. 652,844

Claims priority, application Germany, Sept. 28, 1973, 2241426

Int. Cl.[2] G21C 19/28

U.S. Cl. 176—60 10 Claims



1. Nuclear power plant having a gas coolant flowing in a closed cycle comprising a prestressed concrete pressure tank, a high-temperature reactor located within said tank, a gas turboset including a turbine located within said tank, heat exchange apparatus including recuperators, pre-coolers and intermediate coolers located within said pressure tank, conduit means connecting said reactor, turboset and heat exchange apparatus and forming a flow path for said gas coolant therebetween, wherein the improvement comprises that said tank has a vertically extending axis, said tank forming a horizontally extending tunnel spaced below said nuclear reactor, said turboset being positioned horizontally in the horizontally extending tunnel so that said turboset is spaced and shielded from said reactor by the portion of said concrete pressure tank disposed between said reactor and said turboset, said tank forming a plurality of vertically extending first shafts disposed in an annular arrangement about the vertical axis of said tank with said first shafts located uniformly radially outwardly from said reactor and extending from below to above said reactor, one said recuperator and one said pre-cooler located within each of said first shafts with said pre-cooler arranged to receive the flow of the gas coolant from said recuperator located in the same said first shaft, said conduit means arranged downstream in the path of said gas coolant from said turbine in said turboset is divided into at least two equal partial gas flow systems with each said system including a horizontally arranged first ring segment conduit separate from another horizontally arranged first ring segment conduit of the other said system, said recuperators in said first shafts divided into at least two separate groups with said recuperators in the same group positioned adjacent to one another, the same group of said recuperators each connected

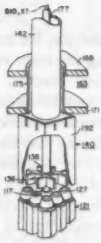
to the same said first ring segment conduit, a tie line interconnecting said turbine and the same group of said recuperators so that flow between said recuperators in the same group takes place through said first ring segment conduit, said conduit means including a horizontally arranged second ring segment conduit corresponding to each said first ring segment conduit and connected to said pre-coolers arranged in the same group with said recuperators interconnected by the corresponding said second ring segment conduit and arranged to receive the flow of said gas coolant from said recuperators connected to the corresponding said first ring segment conduit, a collecting conduit in communication with said second ring segment conduit for returning the flow of gas coolant to said turboset, each said recuperator comprises a nest of tubes, a horizontally arranged third ring segment conduit interconnecting said nests of tubes in each said recuperator within one said group of recuperators, and a tie line connecting said third ring segment to the high pressure stage of said compressor for distributing the gas proportionally to said nests of tubes in said recuperators within one said group of recuperators.

4,050,985

NUCLEAR REACTOR

Howard W. Yant, Greensburg; Karl W. Stinebiser, New Stanton, and Gregory C. Anzur, Herminie, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 13, 1974, Ser. No. 505,891
Int. Cl.[2] G21C *15/26*
U.S. Cl. 176—61 **7 Claims**



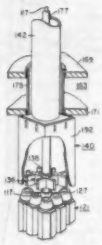
1. A nuclear reactor including a vessel having therein a nuclear core, said core having a plurality of fuel-component assemblies, and an inlet plenum below said core and an outlet plenum above said core, said reactor also including means for supplying a coolant between said inlet plenum and said outlet plenum, said coolant being conducted separately through said assemblies from the inlet plenum to the outlet plenum and exiting said assemblies at a temperature at or in excess of 800° F, the coolant emitted from adjacent assemblies being at substantially different temperatures, the said reactor also including upper internals including supporting means for the upper components of said reactor, the said upper internals also including a plurality of passive outlet modules for conducting said coolant from said adjacent assemblies emitting coolant at substantially different temperatures to said outlet plenum, said plurality of modules substantially forming a continuum above a selected plurality of the fuel component assemblies, each said module being disposed to conduct, mix, and substantially confine the coolant emitted from a subplurality of said assemblies so as to equalize the temperature of the coolant emitted from said subplurality prior to discharge to said outlet plenum, each said module including a grid disposed within said module having a plurality of openings therein each disposed to receive the coolant from an assembly of said last-named subplurality, each opening sized so as to provide peripheral engagement to each respective one of said assemblies, there being one said opening for each respective assembly of said subplurality said grid spaced a predetermined distance from said last-named assembly so as to provide a backup hold-down for said last-named assembly, the said last-named module also including means, interposed between said grid and said outlet plenum for substantially confining the coolant from said last-named subplurality in the region between the outlet of said core and said outlet plenum to a generally vertical path, said modules thereby reducing the effect of thermal stripping on the remainder of the upper internals.

4,050,986

NUCLEAR REACTOR I

Edward W. Ference, Central City; John L. Houtman, Acme, and Robert N. Waldby, New Stanton, all of Pa., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 13, 1974, Ser. No. 505,890
Int. Cl.[2] G21C *19/28, 1/02*
U.S. Cl. 176—61 **5 Claims**



1. A liquid metal cooled nuclear reactor including a vessel, a head plate for said vessel, said vessel supporting a nuclear core therein including a plurality of vertically disposed core assemblies emitting coolant at different temperatures, said vessel also having inlet means below said core and outlet means above said core, and a low thermal inertia upper internals structure suspended above said core for channeling substantially all of said coolant from the top of said core to said outlet means, said suspended structure allowing said assemblies to rise vertically a preselected distance before interfering with said vertical rising, said upper internals structure comprising:

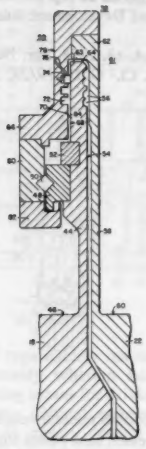
a. a stainless steel weldment including:
   i. a plurality of vertically disposed elongated load bearing columns each affixed at its upper end to said head plate;
   ii. an upper pair of horizontally disposed parallel plates;
   iii. a plurality of upper stub tubes circumferentially welded to said upper plates;
   iv. a lower pair of horizontally disposed parallel plates;
   v. a plurality of lower stub tubes circumferentially welded to said lower plates, and
   vi. means for affixing the lower portion of each said column to said upper and lower plates;
b. a plurality of outlet modules of a refractory corrosion resistant alloy, each said module having a flow collector disposed between said core and said weldment for collecting coolant emitted from a plurality of said assemblies, a cylindrical chimney, said chimney extending upwardly through a concentrically aligned lower stub tube and upper stub tube,
c. means for mechanically affixing said chimney to said weldment, and
d. a peripheral seal affixed to said weldment and extending about the outer periphery of said core for directing the bulk of said coolant from said assemblies into said collectors, said seal formed of a plurality of horizontally abutting blocks having a horizontal section and a plurality of vertical protrusions extending downwardly therefrom, said protrusions circumferentially surrounding the top of some of said assemblies so as to act as a core bundling device.

4,050,987

ROTATING PLUG BEARING AND SEAL

Elman E. Wade, Ruffs Dale, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 30, 1974, Ser. No. 537,474
Int. Cl.[2] G21C *13/06*
U.S. Cl. 176—87 19 Claims



1. A nuclear reactor including an elongated pressure vessel, a pressure vessel closure head secured to said pressure vessel, said pressure vessel closure head having rotatable members above said pressure vessel, and a structure for supporting said members which permits lubrication of seals and bearings, said structure for supporting said members comprising:

a generally planar, rotatable, cylindrical first plug;

a generally planar cylindrical first member having an opening therein, said first member receiving said first plug in said opening;

an annular first support structure secured to the periphery of and extending vertically above said first plug, said first support structure having an extension horizontally outward from the outer side of said first support structure and extending vertically downward, said extension and said first support structure forming a generally U-shaped first annular space;

an annular second support structure having an inner side and an outer side secured to said first member, said first annular space receiving said second support structure therein, said extension of said first support structure and said outer side of said second support structure forming a second annular space;

a bearing having an inner race and an outer race, said outer race being secured to said extension of said first support structure and said inner race being secured to said outer side of said second support structure;

means for sealing said second annular space;

means for lubricating said bearing; and

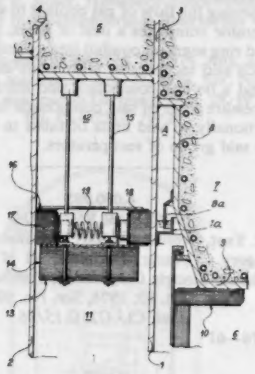
means for lubricating said means for sealing said second annular space.

4,050,988

HEAT-INSULATED DEVICE, FOR INSULATING THE TOP PART OF THE ANNULAR SPACE BETWEEN THE MAIN VESSEL AND THE SAFETY VESSEL OF A FAST-NEUTRON REACTOR

Guy Lemercier, Le Puy Ste-Reparade, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Aug. 29, 1975, Ser. No. 609,168
Claims priority, application France, Aug. 30, 1974, 74.29649
Int. Cl.[2] G21C *13/04;* E04C *3/10;* B65D *25/18*
U.S. Cl. 176—87 8 Claims



1. A heat-insulating device, for insulating the top part of the annular space separating the main vessel from the safety vessel of a fast-neutron nuclear reactor, the two vessels having a common vertical axis and being open at their top part and covered by a horizontal slab of concrete, in which the ends are suspended by the slab, the device comprising a cylindrical bottom heat-insulating ring mounted under the slab and adjacent the facing walls of the vessels to bound the regions to be insulated, the ring extending through the annular space in a horizontal plane and connected to the slab by tie-rods, and a top heat-insulating ring divided into two coaxial elements resting on the bottom ring and pressed and sealed against the walls of the two vessels respectively by an assembly of spacing springs disposed radially and bearing against the two elements.

4,050,989

PROCESS OF PREPARING DESACYL-PEPSIDINE WITH *BACILLUS PUMILUS*

Noriaki Kuwana, Inuyama; Yoshikazu Hasegawa, Kounan, and Yukio Nozu, Gifu, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Division of Ser. No. 638,093, Dec. 5, 1975. This application Apr. 5, 1976, Ser. No. 673,883
Claims priority, application Japan, Dec. 5, 1974, 49-138862
Int. Cl.[2] C12D *13/06*
U.S. Cl. 195—29 9 Claims

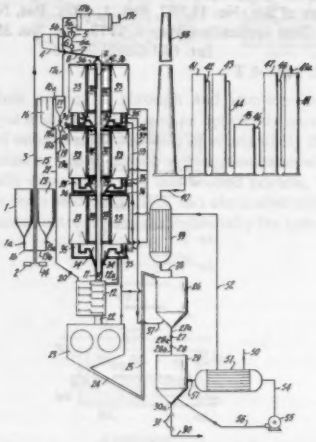
1. A process for the preparation of desacyl-pepsidine which comprises contacting an N-acyl-pentapeptide with a bacterium belonging to *Bacillus pumilus*.

4,050,990

METHOD AND APPARATUS FOR PRODUCING FORM COKE

Kurt Lorenz, Hattingen, Germany, assignor to Firma Carl Still, Germany

Continuation of Ser. No. 604,360, Aug. 13, 1975, abandoned.
This application Sept. 30, 1976, Ser. No. 728,289
Claims priority, application Germany, Aug. 14, 1974, 2439014
Int. Cl.[2] C10B *53/04*; C10L *5/02*
U.S. Cl. 201—5 1 Claim



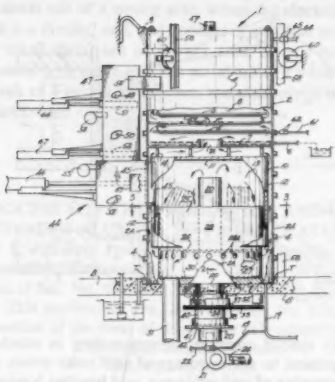
1. A method of producing form coke pieces having uniformly mutually identical shape, comprising directing a non-compressed stream of fine coal into the top of a shaft furnace and permitting it to fall downwardly therein so as to permit the hot walls of the furnace to radiate heat to the fine coal and at a rate and temperature such that the fine coal is heated within 1 or 2 seconds up to from 800° to 900° C, permitting the fine coal to fall through a height within the shaft furnace to cause the coal particles to become degassed as completely as possible, permitting the fine coal which is formed to accumulate at the bottom of the shaft furnace and regularly withdrawing the accumulated quantities of coal particles and mixing it with caking coal in a mixer in proportions of about two parts of fine coke to one part of caking coal while the fine coke is still hot so that the caking coal becomes partly degassed and forms a mixture with the fine coke, drawing off the carbonization gases at various elevations throughout the shaft furnace and separating the gases drawn at the upper levels which are rich in hydrocarbons from the gases drawn at the lower levels which are richer in hydrogen, collecting the carbonization gases and subjecting them to an after heating in the presence of water and steam so as to convert the hydrocarbons and carbon substantially to carbon monoxide and hydrogen and at the same time to decompose the ammonia gases which are formed to nitrogen and hydrogen with the aid of the water and steam, adding a catalyst such as a nickel carrier catalyst to the carbonization gases, directing the withdrawn carbonization gases through connecting ducts which widen in an obliquely upwardly extending direction so that only a minimum quantity of coal and coke dust is entrained by the carbonization gases withdrawn, and directing the carbonization gases into heatable retorts into which steam and water is supplied, pressing the mixture into a coke briquette, exposing the finished briquette to temperatures of up to 400° for 180 minutes so as to harden the briquettes and increase the mechanical resistance of the coke briquettes, and thereafter exposing the coke briquettes to temperatures of up to 900° C for from 60 to 120 minutes for an after hardening of the coke briquettes during which degasification gases are still produced, and thereafter permitting the coke briquettes to cool, recirculating the decarbonization gases back into the shaft furnace, and cooling the briquettes by circulating inert gases over the briquettes and circulating the inert gases which have been heated by the briquettes in heat exchange relationship with water for heating the water.

4,050,991

PYROLYTIC REDUCER AND CONDENSER APPARATUS

Walter C. Kautz, Jr., 21707 NW. 51st Ave., Ridgefield, Wash. 98646

Filed Apr. 23, 1976, Ser. No. 679,704
Int. Cl.[2] C10B *1/04, 53/00*
U.S. Cl. 202—99 11 Claims



1. A pyrolytic reducer and condenser apparatus for the reduction of waste material and condensation of resulting volatiles, said apparatus comprising in combination,

a reduction bin for the reception of waste articles to be reduced, said bin having a side wall with outlet ports and a floor,

an insulative member having a top wall and a side wall and circumposed in a spaced apart manner about at least a portion of the side wall of said bin,

a regulatable reduction heat source including a duct having a discharge end providing a controlled upward heat flow into said insulative member against the top wall thereof, said reduction bin being disposed below the discharge end of said duct and receiving a redirected downward heat flow,

condenser means receiving the heat flow passing downwardly intermediate the reduction bin and insulative member side wall along with the heat flow and waste material volatiles suspended therein discharged through said reduction bin ports for the recovery of condensibles from the reduction flow.

4,050,992

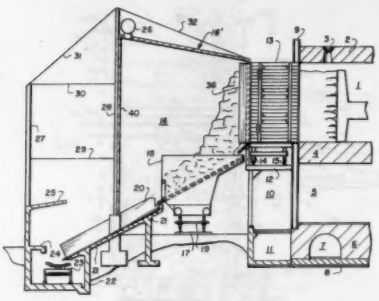
HOUSING CONSTRUCTION EXTENDING OVER THE COKE DISCHARGE AREA OF A HORIZONTAL COKE OVEN BATTERY

Carl Otto Still, Recklinghausen, Germany, and Walter Dean Aust, Pittsburgh, Pa., assignors to Firma Carl Still, Germany

Filed Sept. 30, 1975, Ser. No. 618,006
Claims priority, application Germany, Oct. 2, 1974, 2446987
Int. Cl.[2] C10B *33/00, 39/08*
U.S. Cl. 202—227 5 Claims

1. A structure for use with a coke oven battery having a plurality of horizontally arranged ovens each of which has an opening through which glowing coke may be pushed and which is associated with a quenching station for quenching the glowing coke and which has a housing associated with the station for the offtake of coke gases, comprising a master gangway extending horizontally alongside the battery of ovens, a

guide car trackway along which a coke guide car is movable extending along said gangway, a coke cake guide car movable along said guide car trackway and having an opening on one side alignable with each oven opening in succession for receiving the flowing coke therefrom and having an opposite side with a discharge opening, a quench car trackway for the coke extending alongside and below the guide car trackway, a quench car movable along said quench car trackway to and from the quenching station, said housing extending over the length of said oven battery and having an inner wall adjacent said gangway and positioned between said gangway and said quench car trackway extending over the length of said oven battery, said inner wall facing the discharge opening of said coke cake guide car and the coke ovens with a plurality of



horizontally spaced openings corresponding in number, size and arrangement to the openings of said coke ovens and the discharge opening of said guide car, said housing having a roof extending from said inner wall over the quench car trackway and enclosing said trackway overall of said oven up to said quenching station with the height of the roof being above the guide car, and means associated with said housing for the offtake of gases, said housing including an outer wall spaced from and parallel to said wall adjacent said gangway, said outer wall having a chute extending therethrough alignable with one side of said coke quench car at least along one position of its travel along said quench car trackway, and a coke conveyor for conveying quenched coke located alongside the discharge of said chute in a position to receive the quenched coke and to transport it away.

4,050,993

DISTILLATION OF READILY POLYMERIZABLE ETHYLENICALLY UNSATURATED COMPOUNDS

Calvin L. Daniels, Big Spring, Tex., assignor to Cosden Oil & Chemical Company, Big Spring, Tex.

Filed Sept. 11, 1972, Ser. No. 288,138
Int. Cl.[2] B01D *3/34*; C07C *7/18*
U.S. Cl. 203—9 **7 Claims**

1. A process for the distillation of a readily polymerizable aromatic hydrocarbon having ethylenically unsaturated substituents which comprises subjecting such compound to distillation conditions in the presence of N,N-nitroso-methylaniline as a polymerization inhibitor in a system from which oxygen and sulfur have been excluded.

4,050,994

RECOVERY OF 2-PYRROLIDONE FROM DILUTE ALKALINE SOLUTIONS

Byron E. Anshus, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 26, 1976, Ser. No. 745,501
Int. Cl.[2] B01D *3/34*; C07D *207/12*
U.S. Cl. 203—35 **4 Claims**

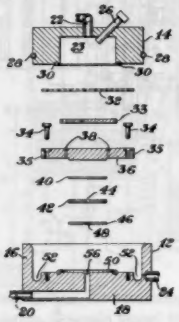
1. A process for the recovery of 2-pyrrolidone from alkaline aqueous solution, which comprises the steps of adding sulfuric acid to said solution in amounts sufficient to provide a neutralized or acidified solution of 3–7 pH, removing by a first evaporation a major amount of the water from said neutralized or acidified solution to provide a slurry comprising sulfate salt and 2-pyrrolidone, and recovering 2-pyrrolidone from said slurry by a second evaporation under reduced pressure.

4,050,995

METHOD FOR DETERMINING WATER VAPOR TRANSMISSION RATE OR WATER CONTENT

Roger L. Bredeweg, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 11,557, Feb. 1, 1971, Pat. No. 3,886,057.
This application May 9, 1973, Ser. No. 358,576
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—1 T **4 Claims**



1. A method for determining water vapor transmission rate through a plastic film sample or like sample structure comprising:

a. placing the sample in a sealed cell;
b. evacuating substantially all water vapor from the sample and cell;
c. introducing a measured quantity of water into the cell on one side of the sample;
d. drawing the water vapor of such water through the sample and into a fibrous body having an electrically conductive water absorption material therein;
e. electrolyzing the water vapor in the fibrous body into hydrogen and oxygen;
f. transporting said hydrogen and oxygen from said cell to a mass spectrometer;
g. measuring the quantity of said hydrogen and oxygen transported from said cell in said mass spectrometer; and
h. determining the water vapor transmission rate of said test sample from the quantity of said hydrogen and oxygen transported.

4,050,996

ELECTOCHEMICALLY EXCHANGING A STEEL SURFACE WITH A PURE IRON SURFACE

Otto J. Klingenmaier, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 3, 1976, Ser. No. 738,450
Int. Cl.[2] C25D *5/04, 7/06*
U.S. Cl. 204—28 **4 Claims**

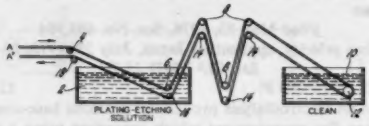
1. A process for exchanging a surface layer of a moving steel strip for an iron layer of different composition comprising the steps of:

anodically polarizing a first portion of a moving steel electrode-strip while passing it in one direction through an iron-ion-containing electrolyte in spaced relation to an oppositely moving and polarized counter-electrode-strip of substantially the same composition as said electrode-strip to concurrently electrolytically erode the surface of

said electrode-strip, supply iron ions to said electrolyte therefrom, and electrodeposit iron onto said counterelectrode strip at substantially the same rate as the electrode strip is eroded;

cleansing said eroded surface of any impurities left thereon; and

cathodically polarizing a second portion of said electrode-



strip while passing it through and iron-ion-containing electrolyte is spaced relation to an oppositely moving and polarized counterelectrode strip of substantially the same composition as said electrode-strip to simultaneously electrolytically deposit iron on said second portion, remove iron ions from said electrolyte and electrolytically erode said counterelectrode strip at substantially the same rate as said second portion is plated.

4,050,997

METHOD OF MANUFACTURING A FIBER REINFORCED COMPOSITE MATERIAL

Herbert Heissler, Munich, Germany; Eckart Hitsch, Salzburg, Austria, and Wolfgang Scheer, Munich, Germany, assignors to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 315,986, Dec. 18, 1972, abandoned. This application May 16, 1975, Ser. No. 578,187

Int. Cl.² C25D *7/06*

U.S. Cl. 204—28 **10 Claims**

1. A process for producing reinforcing carbon fiber for the manufacture of carbon fiber reinforced materials, said carbon reinforcing fiber being composed of carbon fiber substrate having a light metal or metalloid coating thereon exhibiting improved adhesion for the carbon fiber substrate, said process comprising:

forming on the surfaces of said carbon fiber substrate chemical groups capable of forming bonds with respect to the light metal or metalloid of said coating, said chemical groups being formed on the surfaces of said fiber substrate by passing said fiber substrate through an electrically conductive liquid and applying a voltage to said fiber substrate, said voltage being applied to said fiber substrate by spaced voltage applying means in said liquid, each of said voltage applying means being spaced from said fiber substrate so that activated current is applied to said fiber substrate by way of said conductive liquid and without mechanical contact of said fiber substrate with said applying means, and thereafter

depositing said light metal or metalloid on the surfaces of the fiber substrate by (a) contacting said fiber substrate with a composition comprising a compound capable of decomposing to yield said light metal or metalloid in atomic form and a solvent for said compound and (b) causing said compound to decompose to thereby yield said light metal or metalloid in atomic form whereby said light metal or metalloid deposits on the surfaces of said fiber substrate and combines with the chemical groups.

4,050,998

ELECTROLYTIC REDUCTION OF AROMATIC STEROIDS

Klaus Junghans, Berlin, Germany, assignor to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Continuation-in-part of Ser. No. 489,160, July 17, 1974, abandoned. This application June 8, 1976, Ser. No. 693,849

Claims priority, application Germany, July 18, 1973, 2337155

Int. Cl.² C25B *3/04*

U.S. Cl. 204—59 R **12 Claims**

1. A process for the electrolytic reduction of $\Delta^{1,3,5(10)}$ steroids to $\Delta^{2,5(10)}$ steroids which comprises subjecting a $\Delta^{1,3,5(10)}$ steroid to electrochemical reduction wherein the solvent consists of liquid ammonia and wherein the electrolyte consists of an alkali metal salt of a strong acid, when the electrolysis is conducted in a divided cell, and consists of an alkali metal hydroxide or alkali metal salt of a weak acid, or of a mixture of an alkali metal hydroxide or alkali metal salt of a weak acid and an alkali salt of a strong acid, when the electrolysis is conducted in an undivided cell.

4,050,999

PROCESS FOR THE PRODUCTION AND USE OF ACTIVATED ALUMINA TO PRODUCE ALUMINUM

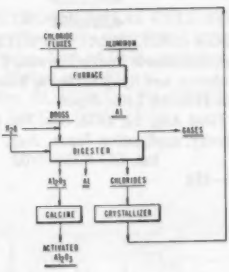
Arthur F. Johnson, Franklin Lakes, N.J., assignor to R.C.M. Corporation, Fontana, Calif.

Division of Ser. No. 483,129, June 26, 1974, Pat. No. 3,955,969. This application Jan. 28, 1976, Ser. No. 653,265

The portion of the term of this patent subsequent to May 11, 1993, has been disclaimed.

Int. Cl.² C25C *3/06*

U.S. Cl. 204—67 **1 Claim**



1. The process for the production and use of activated alumina from dross containing aluminum particles, alumina and impurities comprising:

a. charging said dross onto a layer of molten halide salts underlain by a layer of molten aluminum in a holding furnace, whereby a portion of the aluminum entrained within the dross enters the aluminum layer and the alumina and impurities are entrained in the halide flux layer;

b. separating said dross from said molten aluminum; digesting said dross with hot water to at least partially dissolve halide salts and other soluble impurities and decompose insoluble impurities;

c. separating remaining aluminum particles and the purified alumina from said water as separate fractions;

d. washing said digested alumina with hot water to remove any residual, soluble impurities;

e. drying said alumina to produce an activated alumina;

f. crystallizing and drying said halide salts from said water, and returning to said holding furnace;

g. contacting said calcined alumina with fluoride gases generated in an operating aluminum reduction cell; and

h. thereafter using said alumina for reduction in said cell.

4,051,000

NON-CONTAMINATING ANODE SUITABLE FOR ELECTROWINNING APPLICATIONS

Aubrey Stewart Gendron, Lively; Shinichiro Abe, Toronto; Victor Alexander Ettel, and Charles Edward O'Neill, both of Mississauga, all of Canada, assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Oct. 28, 1975, Ser. No. 625,899
Claims priority, application Canada, Nov. 4, 1974, 212965
Int. Cl.[2] C25C *1/12, 1/16, 1/22, 7/02*
U.S. Cl. 204—106 14 Claims

11. A method for electrowinning a metal from the group consisting of nickel, copper, cobalt and zinc from an electrolyte containing one of said metals using an insoluble anode and cathode while inhibiting contamination of said metal deposited on said cathode which comprises.

establishing an electrowinning cell comprising an insoluble non-contaminating anode and an insoluble cathode in said electrolyte,

said non-contaminating anode comprising a metal substrate formed of a metal selected from the group consisting of titanium, zirconium, tantalum and alloys thereof, said metal substrate having a flash-coating of a platinum-group metal, and coating being in turn covered by a duplex metal oxide coating comprising essentially an intermediate of lead dioxide having a thickness of about 50 to about 2000 microns adhering to said platinum-group metal coating and an overlayer of manganese dioxide having a thickness of about 10 to about 1000 microns adhering to said lead dioxide layer,

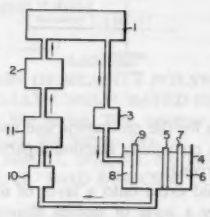
and then passing a current from said insoluble anode to said cathode, whereby said metal is deposited on said cathode and whereby contamination of metal deposited on said cathode is greatly inhibited.

4,051,001

PROCESS FOR REGENERATING ETCHING SOLUTION

Hajime Inoue, Kamakura; Fumio Harada, Yokohama; Kazunobu Kato, Yokohama, and Syoji Oikawa, Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 22, 1975, Ser. No. 607,037
Claims priority, application Japan, Aug. 26, 1974, 49-97098
Int. Cl.[2] C25F *7/02*
U.S. Cl. 204—151 7 Claims



1. A process for the regeneration of an acidic etching solution containing cupric chloride used in etching of copper comprising the steps of

a. electrolyzing a used acidic etching solution containing cupric chloride and cuprous chloride in an electrolytic cell having a cathode compartment separated by a diaphragm from an anode compartment, said used acidic etching solution being contained in said cathode compartment wherein a copper ion concentration of said used acidic etching solution is reduced by deposition of metallic copper on a cathode, a caustic soda solution being contained in said anode compartment wherein chlorine is absorbed by said caustic soda solution, and

b. treating an etching solution resulting from an electrolysis according to step (a) with hydrogen peroxide to increase a cupric ion concentration by oxidizing cuprous ions to cupric ions and with hydrochloric acid to increase a chloride ion concentration, said treatment producing a regenerated acidic etching solution containing cupric chloride.

4,051,002

ELECTRODIALYSIS FOR AQUEOUS SOLUTION OF BASE

Tomoki Gunjima, Yokohama, and Toshio Ichiki, Kawasaki, both of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed May 13, 1976, Ser. No. 685,984
Claims priority, application Japan, July 25, 1975, 50-90188
Int. Cl.[2] B01D *13/02*
U.S. Cl. 204—180 P 12 Claims

1. In an electrodialysis process for aqueous base-containing solutions the improvement which comprises using a sulfonic acid group-free cation-exchange membrane which is a copolymer of ethylene and an unsaturated carboxylic acid or a salt thereof having an ion-exchange capacity of 0.7 to 3 m equivalent/g (dry resin).

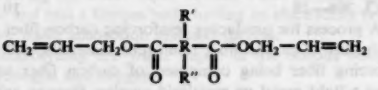
4,051,003

CURABLE COMPOSITIONS DIALLYL ESTERS OF DICARBOXYLIC ACIDS AND FLUOROPOLYMERS

Elihu J. Aronoff, Framingham, and Kewal Singh Dhami, Shrewsbury, both of Mass., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 489,697, July 18, 1974, abandoned, which is a division of Ser. No. 401,973, Oct. 1, 1973, abandoned. This application Mar. 26, 1976, Ser. No. 670,693
Int. Cl.[2] C08F *8/00*
U.S. Cl. 204—159.17 4 Claims

1. A high temperature processing fluorocarbon homopolymer or copolymer selected from the group consisting of polymers and copolymers of ethylene-tetrafluoroethylene, ethylene-chlorotrifluoroethylene, vinylidene fluoride, tetrafluoroethylene-vinylidene fluoride, tetrafluoroethylene-hexafluoropropylene, vinylidene fluoride-hexafluoropropylene, vinylidene fluoride-hexafluoropropylene-tetrafluoroethylene and mixtures thereof having incorporated therein a crosslinking coreactant compound comprising a diallyl ester having the structural formula:



wherein R is an organic radical containing from 4 to 20 carbon atoms and is selected from the group consisting of alkyl radicals, cycloalkyl radicals and mixed alkyl-cycloalkyl radicals; R′ and R″ are independently selected from hydrogen, alkyl, cycloalkyl, aralkyl and aryl radicals and mixtures thereof; and the total carbon atoms in R, R′ and R″ is from 10 to 34.

4,051,004

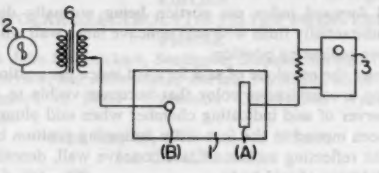
ELECTRODEPOSITION COATING METHOD USING ALTERNATING CURRENT

Takashi Sunamori, and Sachio Obana, both of Ohtake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed June 19, 1975, Ser. No. 588,654
Claims priority, application Japan, June 26, 1974, 49-73582; July 1, 1974, 49-75628; July 24, 1974, 49-84112; July 24, 1974, 49-84113; July 24, 1974, 49-84114; Aug. 1, 1974, 49-88413
Int. Cl.[2] C25D *13/18*
U.S. Cl. 204—181 40 Claims

1. A method for producing a coated article which comprises filling an electrodeposition coating vessel with an aqueous solution or dispersion of an electrodeposition coating composition containing as the paint binder the below-mentioned salt of a purified resin, immersing in said vessel an article to be coated (A) having an electrode area of S_1 and an opposite electrode

(B) having an electrode area of S_2 in such proportions that the electrode area ratio S_1/S_2 becomes 1.5 to 300, connecting the article to be coated (A) and the opposite electrode (B) to an alternating current electric source, and impressing an alternating current to the electrodes to deposit the aforesaid electrodeposition coating composition onto the article to be coated (A), wherein the salt of purified resin is:



i. a salt of a polycarboxylic acid resin having an acid value of 5 to 50 which has a $pK_a(r)$ value, as defined by the formula (I) shown below, of 8.0 or more, an n value of 0.5 to 1.5 and a degree of neutralization of 0.3 to 1.5, and which contains 5 wt% or less of low molecular weight acidic impurities having a $pK_a(e)$ value, as defined by the formula (II) shown below, of at least 0.5 smaller than the $pK_a(r)$ value of the main component of the resin,

$$pH = pK_a(r) + n \log \frac{\alpha}{1-\alpha} \quad (I)$$

wherein pH is the pH value of an aqueous solution of the salt of the polycarboxylic acid resin; $pK_a(r)$ is the constant $-\log K_a(r)$; $K_a(r)$ is the dissociation constant in water of the polycarboxylic acid resin; n is a parameter showing the degree of spreading of the polycarboxylic acid resin when the resin is dissolved or dispersed in an aqueous medium; and α is the degree of neutralization of the polycarboxylic acid resin with a base,

$$pH = pK_a(e) + \log \frac{\alpha}{1-\alpha} \quad (II)$$

wherein pH is the pH value of an aqueous solution of the acidic impurities; $pK_a(e)$ is the constant $-\log K_a(e)$; $K_a(e)$ is the dissociation constant in water of said impurities; and α is the degree of neutralization of said impurities with a base, or

ii. a salt of a nitrogen-containing basic resin high in hydrophobic property which has a $pK_b(r)$ value, as defined by the formula (III) shown below, of 6.0 or more, an n' value of 0.5 to 1.5, and a degree of neutralization α' of 0.3 to 1.5, and which contains 5 wt% or less of low molecular weight basic impurities having a $pK_b(e)$ value, as defined by the formula (IV) shown below, of at least 0.5 smaller than the $pK_b(r)$ value of the main component of the nitrogen-containing basic resin,

$$pOH = pK_b(r) + n' \log \frac{\alpha'}{1-\alpha'} \quad (III)$$

wherein pOH is the pOH value of an aqueous solution of the salt of the nitrogen-containing basic resin; $pK_b(r)$ is the constant $-\log K_b(r)$; $K_b(r)$ is the dissociation constant in water of the nitrogen-containing basic resin; n' is a parameter showing the degree of initial spreading of the nitrogen-containing basic resin when the resin is dissolved or dispersed in an aqueous medium; and α' is the degree of neutralization of the nitrogen-containing basic resin with an acid,

$$pOH = pK_b(e) + \log \frac{\alpha'}{1-\alpha'} \quad (IV)$$

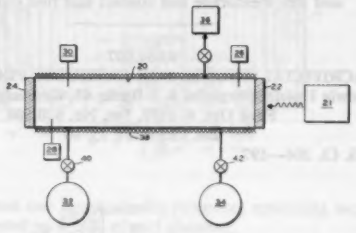
wherein pOH is the pOH value of an aqueous solution of the basic impurities; $pK_b(e)$ is the constant $-\log K_b(e)$; $K_b(e)$ is the dissociation constant in an aqueous medium of said impurities; and α' is the degree of neutralization of said impurities with an acid.

4,051,005

PHOTOLYTIC PRODUCTION OF HYDROGEN

Nicholas Leo Krascella, Manchester, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sept. 21, 1976, Ser. No. 725,303
Int. Cl.² B01J 1/10
U.S. Cl. 204—157.1 R **10 Claims**



1. In the production of hydrogen from water the improvement which comprises:

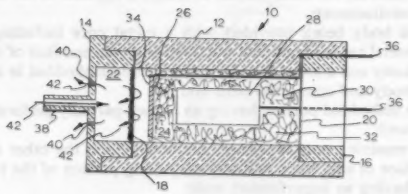
as an essential step thereof forming a water-halogen gas mixture and irradiating the mixture with radiation energy in the visible spectrum to form the corresponding hydrogen halide and processing the hydrogen halide to effect the release of hydrogen therefrom.

4,051,006

PORTABLE ELECTROCHEMICAL CELL STRUCTURE

Radhakrishna Murty Neti, Brea, and Ray Lawrence Roggenkamp, Fountain Valley, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 22, 1976, Ser. No. 669,072
Int. Cl.² G01N 27/46
U.S. Cl. 204—195 P **6 Claims**



1. An electrochemical cell comprising:

a. a body having a space therein and two openings into said space, said body being of an electrochemically inert material;

b. a first membrane disposed to cover one of said two openings in said body, said first membrane being of a highly porous electrochemically inert material;

c. a second membrane disposed to cover the other of said two openings in said body, said second membrane being of highly porous electrochemically inert material;

d. a first electrode disposed within said space in said body closely adjacent and in non-contacting relationship with said first membrane, said first electrode having a non-sintered layer of platinum black and polytetrafluoroethylene disposed thereon;

e. a second electrode disposed within said space in said body in non-contacting relationship with said first electrode;

f. an electrochemically inert hydrophilic filler material dis-

posed within said space in said body and in contact with said first and second electrodes;

g. an electrolytic material disposed throughout a portion of said filler material and being in contact with said first and second electrodes whereby an electrical path between said first and second electrodes is established through said electrolytic material;

h. means adapted for providing an electrical connection operably connected to said first and second electrodes; and,

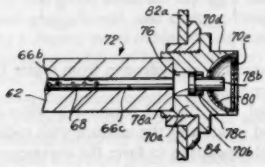
i. means disposed adjacent said first membrane for causing an electrochemical reaction producing fluid to permeate said first membrane and contact said first electrode.

4,051,007

SACRIFICIAL ANODES FOR CATHODIC PROTECTION

Ludwig Hossle, Burgipfad 4, 1 Berlin 45, Germany

Filed Oct. 6, 1975, Ser. No. 620,104
Int. Cl.² C23F 13/00
U.S. Cl. 204—197 **1 Claim**



1. A sacrificial anode for cathodic protection of inner portions of a tank and the like, at least partly filled with a liquid, which portions are exposed to a corrosive inner environment, to be protected against corrosion by the provision of the sacrificial anode that is consumed while its material gradually migrates through the liquid to and is deposited on the inner tank portions, in the absence of an external voltage being applied, and wherein the innter tank environment also promotes detrition of the sacrificial anode;

the latter comprising a generally cylindrical body of anodic material, the outer surface of which is exposed to the tank environment;

said body being provided with a metal core including a metal bar having a first end flush with one end face of said body and a metal tube having a portion embedded in said body and connected with said bar;

the embedded portion having an at least partially perforated wall;

a remaining portion thereof projecting from the other end face of said body, and said projecting portion of the tube having an imperforated wall;

said body normally constituting a barrier between the interior of said tube and the tank environment;

whereby the latter reaches communication with an external test location by way of at least one of the perforations in said tube wall when that perforation becomes communicative as a result of progressed detrition of at least an adjacent portion of said body, at which point the sacrificial anode should be replaced for continued effective cathodic protection;

a closure cap connected to said body and to said tube;

said closure cap having a first portion defining a first chamber that communicates with said tube interior;

a plunger, at least partly slidable in said chamber and sealingly engaging an inner wal of said first chamber with a portion thereof;

the movement of said plunger being responsive to the detrition of said body and as a result of a pressure difference being relayed thereto through said tube;

spring means in said first chamber and between a portion of said plunger and said inner wall of the first chamber for normally biasing said plunger into a rearwardly, non-indicating rest position toward said tube, while the pressure difference will move said plunger against said spring means into a forwardly indicating position;

a second portion of said cap defining an indicating second chamber having an at least partly light-reflecting concave inner wall;

said plunger including a forward index pin portion protruding from said first chamber;

said forward index pin portion being normally disposed substantially flush with said concave inner wall when in a non-indicating position;

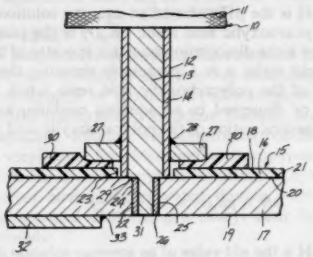
at least the envelope of said forward index pin portion having a conspicuous color that becomes visible to an observer of said indicating chamber when said plunger has been moved to the forwardly indicating position beyond the reflecting surface of said concave wall, denoting the detrition of said body.

4,051,008

FLANGED CONNECTION MEANS FOR ANODE POSTS IN ELECTROLYTIC DIAPHRAGM CELLS

James M. Ford, Cleveland, Tenn.; Morton S. Kircher, Oakville, Canada, and Hugh A. Mosher, Paget East, Bermuda, assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 31, 1976, Ser. No. 672,370
Int. Cl.² C25B 1/16, 1/26, 9/02
U.S. Cl. 204—266 **9 Claims**



1. In an electrolytic cell including:

a. a cell base having:

i. an interior layer which provides an interior surface, having a plurality of separate first openings therethrough, and

ii. a conducting layer secured to said interior layer which provides an exterior surface, having a plurality of separate second openings therein,

iii. said first and second openings being aligned to provide a plurality of separate openings in said cell base for a plurality of anode posts,

b. a cell body secured to said cell base,

c. a plurality of diaphragm-coated cathodes secured to said cell body,

d. a plurality of anodes, each anode having

1. an anode post secured to said cell base, and

2. a metallic conductive surface secured to said anode post,

3. each metallic conductive surface being positioned adjacent to and parallel to at least one of said cathodes,

e. and current conducting means secured to said exterior surface,

the improved securing means for securing said anode posts to said cell base, comprising;

f. separate soldered connections, between each of said anode posts and said cell base, in said separate openings for securing each anode post in indirect contact with the conducting layer in said cell base, and

g. flange means, positioned on each of said anode posts

above said soldered connection, for providing an upward seating surface and

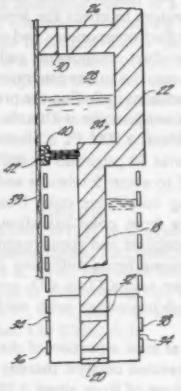
h. liquid-tight seal means, between said seating surface of said flange and said interior layer of each of said anode posts, for isolating said soldered connections from an interior space of said cell.

4,051,009

BIPOLAR ELECTROLYTIC FILTER PRESS CELL FRAME

Albert John Schweickart, Southgate; Stephen Michael Collins, Riverview, and John Joseph Bortak, Plymouth, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed May 19, 1975, Ser. No. 578,406
Int. Cl.² C25B 9/02
U.S. Cl. 204—279 **15 Claims**



1. A cell frame for a bipolar electrolytic filter press cell, comprising:

a. a peripheral rim,

b. a first linear section defining a central web recessedly disposed within the rim, one side of the web defining a catholyte side and the other an anolyte side,

c. a U-shaped section integrally formed with the linear section and cooperating therewith to define a recessed area communicating with the anolyte side above the first linear section, the recessed area extending away from the anolyte side of the central web,

d. the portion of the frame extending from the top of the central web downwardly defining a lower zone at which electrolysis is carried out,

e. the portion of the frame extending upwardly from the top of the central web defining an upper zone for disengagement the electrolysis-generated gases, and

f. means for preventing distortion of the central web and facilitating disengagement of the gases disposed between the upper zone and the lower zone on the anolyte side of the frame.

4,051,010

SPUTTERING APPARATUS

Marvin E. Roth, and Donald J. Vallere, both of Reading, Pa., assignors to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 642,043, Dec. 18, 1975, Pat. No. 4,022,939.
This application Jan. 10, 1977, Ser. No. 758,300
Int. Cl.² C23C 15/00
U.S. Cl. 204—298 **2 Claims**

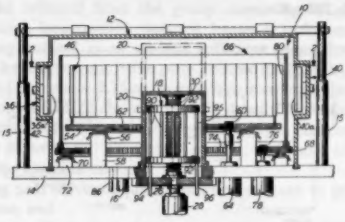
1. A sputtering apparatus comprising:

a cylindrical vacuum chamber having therewithin;

a. a vacuum pump disposed along the longitudinal axis of said chamber,

b. a cylindrical workholder assembly concentric with and disposed around said pump,

c. a cylindrical shutter concentric with and disposed around said workholder assembly, said shutter having at least one longitudinally extending opening through a wall thereof, and



d. at least one longitudinally extending sputtering target mounted on a wall of said chamber;

means for rotating said workholder assembly about said axis for disposing successive portions of said workholder assembly into radial alignment with said at least one target; and

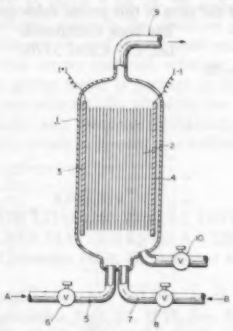
means for selectively disposing said at least one opening into alignment with said at least one target.

4,051,011

CONTINUOUS ENZYMATIC REACTOR

Terukatsu Miyauchi, Yokohama, and Shintaro Furusaki, Zushi, both of Japan, assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Oct. 22, 1975, Ser. No. 624,901
Claims priority, application Japan, Oct. 26, 1974, 49-123699
Int. Cl.² C25B 7/00, 9/00; C12B 1/00
U.S. Cl. 204—299 R **16 Claims**



1. A device for performing catalytic enzymatic reactions comprising:

a. a reaction vessel equipped with a valved inlet port for supplying electrically charged colloidal enzyme solution, a valved inlet port for supplying reactant substrate solution, a valved drain port, and an outlet port for discharge of reacted product; and

b. at least one carrier with enzyme entrapped thereon located inside said reaction vessel; and

c. means for inducing a continuous electrical field across said reaction vessel such that, in operation, colloidal enzyme introduced into said reaction vessel migrates to and is held by said carrier under the potential of said electric field, which enzyme is held fixed by electrical forces during

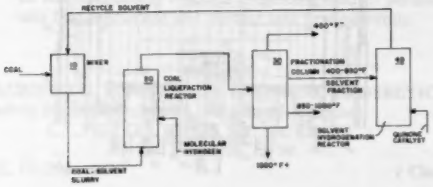
continuous enzymatic reaction of said reactant to reacted product with no substantial loss of enzyme.

4,051,012

COAL LIQUEFACTION PROCESS

Karl W. Plumlee, and Lonnie W. Vernon, both of Baytown, Tex., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed May 17, 1976, Ser. No. 686,827
Int. Cl.² C10G *1/04*
U.S. Cl. 208—8 **10 Claims**



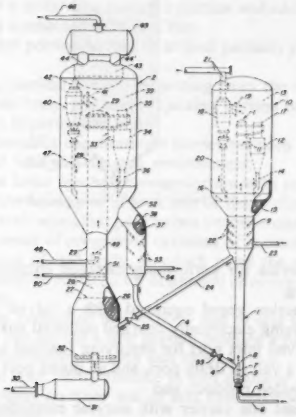
1. A process for liquefying a particulate coal feed to produce useful petroluem-like liquid products, which comprises: (a) contacting, in a liquefaction zone, said coal feed with a hydrogen donor solvent at temperature and pressure sufficient to hydroconvert and liquefy the coal, (b) separating the product from the liquefaction zone into fractions inclusive of a liquid solvent fraction which contains at least 30 weight percent hydrogen donor compounds, (c) hydrogenating said liquid solvent fraction in a hydrogenation zone in the presence of an added quinone, compound and (d) recycling the hydrogenated liquid solvent mixture to said coal liquefaction zone.

4,051,013

FLUID CATALYTIC CRACKING PROCESS FOR UPGRADING A GASOLINE-RANGE FEED

Charles W. Strother, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation of Ser. No. 361,911, May 21, 1973, Pat. No. 3,948,757. This application Dec. 3, 1975, Ser. No. 637,446
The portion of the term of this patent subsequent to Apr. 6, 1993, has been disclaimed.
Int. Cl.² C10G *37/02*
U.S. Cl. 208—78 **5 Claims**



1. A fluid catalytic cracking process for simultaneously cracking a gas oil feed and upgrading gasoline-range hydrocarbon feed which process comprises the steps of:

a. contacting the gasoline-range feed with freshly regenerated catalyst in a relatively upstream portion of a short-time dilute-phase riser reaction zone which portion is maintained at first catalytic cracking conditions including a gasoline-range-feed residence time of less than about 0.5 seconds in the presence of said catalyst, a temperature within the range of about 1,250° F. to about 1,500° F. and a catalyst-to-gasoline-range-feed weight ratio of at least about 75 to 1;

b. contacting the gas oil feed with used catalyst in a relatively downstream portion of the short-time dilute-phase riser reaction zone which portion is maintained at second catalytic cracking conditions including a gas-oil residence time of less than about 10 seconds in the presence of used catalyst, a temperature in the range of from about 900° F. to about 1,100° F. and a catalyst-to-gas-oil-feed weight ratio of from about 4 to about 25 to 1;

c. passing catalyst and feed streams in admixture through the riser reaction zone to produce spent catalyst, containing coke, and product components including gasoline;

d. discharging the mixture from said reaction zone into cyclone separators to effect the separation of spent catalyst from product components and any unreacted feed;

e. recovering product components and any unreacted feed;

f. passing spent catalyst to a regeneration zone maintained at oxidizing conditions including the presence of fresh regeneration gas, a temperature within the range of from about 1,250° F. to about 1,500° F., a pressure from about atmospheric to about 50 psig. and a catalyst residence time of from about 2 to about 5 minutes and therein oxidizing at said oxidizing conditions coke from spent catalyst and CO, resulting from coke oxidation, to produce freshly regenerated catalyst and spent regeneration gas, said oxidizing conditions being sufficient to substantially completely oxidize said CO to CO_2 and said CO oxidation being effected in contact with said freshly regenerated catalyst;

g. transferring at least a portion of the heat of CO combustion to regenerated catalyst thereby heating said catalyst to a temperature of from about 1,250° F. to about 1,500° F.; and,

h. returning heated regenerated catalyst to said reaction zone of step (a) above.

4,051,014

PROCESS FOR TREATING SULFUR-CONTAINING HYDROCARBON FEEDSTOCKS TO PRODUCE HIGH YIELD COKE

George P. Masologites, Olympia Fields, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 318,250, Dec. 26, 1972, abandoned. This application Aug. 26, 1974, Ser. No. 500,439
Int. Cl.² C10G *34/00*
U.S. Cl. 208—88 **11 Claims**

1. A process for producing coke which comprises:

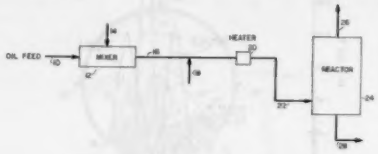
1. contacting a sulfur containing hydrocarbon feedstock containing at least 1% by weight Conradson Carbon Residue with at least one peroxy oxidant in the presence of a catalyst comprising a metal in an amount effective to promote the oxidation of sulfur to preferentially oxidize at least a portion of the sulfur contained in said hydrocarbon feedstock, said metal being selected from the group consisting of Group IVB, Group V, Group VI and mixtures thereof;

2. subjecting said oxidized sulfur-containing hydrocarbon feedstock to coking conditions at temperatures in the range from about 800° F. to about 1100° F. to produce a coke product from said coking having a sulfur content reduced by at least 40% by weight relative to the sulfur content of a coke product produced by subjecting the feedstock to the coking conditions of step 2 without the oxidation of step 1.

4,051,015
HYDROCONVERSION OF HEAVY HYDROCARBONS USING COPPER CHLORIDE CATALYST

Roby Bearden, Jr., and William C. Baird, Jr., both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed June 11, 1976, Ser. No. 695,072
Int. Cl.[2] C10G *23/02*
U.S. Cl. 208—108 9 Claims

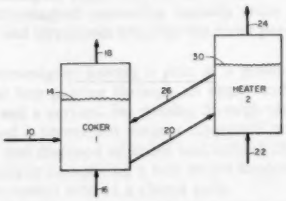


2. A process for the hydroconversion of a heavy hydrocarbonaceous oil, which comprises contacting said oil in liquid continuous phase with hydrogen and a particulate catalyst consisting essentially of a chloride of copper selected from the group consisting of cuprous chloride, cupric chloride and mixtures thereof, said catalyst being present in said oil in an amount ranging from about 1 to about 50 weight percent, at a temperature of at least 750° F. and under hydrogen partial pressure of at least about 500 psig.

4,051,016
FLUID COKING WITH H_2S ADDITION

William J. Metrailer, Baton Rouge, La.; Charles Rebick, Mountainside, and Richard K. Lyon, Fanwood, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Jan. 27, 1976, Ser. No. 652,761
Int. Cl.[2] C10G *9/32*
U.S. Cl. 208—127 9 Claims



1. In a fluid coking process comprising the steps of contacting a carbonaceous material having a Conradson carbon content of at least 5 weight percent with hot fluidized solids in a fluidized coking bed contained in a coking zone maintained in a fluidized state by the introduction of a fluidizing gas and operated at coking conditions, including a pressure ranging from about 0 to about 150 psig, to produce a vapor phase product and a solid carbonaceous material which deposits on said fluidized solids, the improvement which comprises introducing into said coking zone a fluidizing gas comprising from about 5 to about 40 mole percent of hydrogen sulfide, based on the total gas introduced into said coking zone.

4,051,017
CATALYTIC HYDROCARBON REFORMING PROCESS AND CATALYST

William Ralph Beaty, Jr., Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Division of Ser. No. 540,915, Jan. 14, 1975, Pat. No. 3,966,588, which is a division of Ser. No. 360,274, May 14, 1973, Pat. No. 3,900,430. This application Feb. 27, 1976, Ser. No. 662,184
Int. Cl.[2] C10G *35/06, 35/08*
U.S. Cl. 208—135 13 Claims

1. A catalyst for hydrocarbon reforming consisting essentially of from about 0.01 to about 10 weight percent based on the catalyst weight of at least 1 catalytic metal selected from the group consisting of palladium, vanadium, platinum, rhenium and iridium, supported on a gamma alumina produced by a process consisting essentially of

a. hydrolyzing aluminum alkoxides to produce an aqueous alumina portion containing up to about 32 weight percent Al_2O_3 and an organic reaction product;

b. contacting said aqueous alumina slurry with an organic solvent selected from the group consisting of ethanol, propanol, isopropanol, butanol, hexanol, isobutanol and tertiary butanol in an amount sufficient to produce alumina having a cumulative pore volume (0–10,000A) from about 1.0 to about 2.75 cc/g, a surface area from about 225 to about 400 m^2/g and a loose bulk density from about 7.5 to about 25 lb/ft^3 upon drying to an Al_2O_3 content from about 80 to about 100 weight percent to form a solvent-aqueous alumina mixture;

c. drying said solvent-aqueous alumina mixture to produce alumina; and

d. forming said alumina of (c) into particles and calcining to produce said gamma alumina.

4,051,018
HYDROCARBON CONVERSION WITH A SELECTIVELY SULFIDED ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

H. Peter G. Knapik, Brookfield, and Frank H. Adams, La Grange Park, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 638,798, Dec. 8, 1975. This application Mar. 4, 1977, Ser. No. 774,284
Int. Cl.[2] C10G *35/08*
U.S. Cl. 208—139 19 Claims

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon in a reaction zone maintained at hydrocarbon conversion conditions with a selectively sulfided acidic catalytic composite comprising a halogenated porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.1 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % tin and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available cobalt, and tin are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the tin is present in the form of tin oxide; and wherein substantially all of the catalytically available cobalt is present in a sulfided state.

4,051,019
METHOD FOR LOADING FINELY DIVIDED PARTICULATE MATTER INTO A VESSEL

James A. Johnson, Clarendon Hills, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 463,074, April 22, 1974, abandoned. This application Sept. 25, 1975, Ser. No. 616,798
Int. Cl.[2] B65B *37/02;* B65G *3/04;* C10G *11/01*
U.S. Cl. 208—146 4 Claims

1. A method for forming a fixed-bed of catalyst particles which is subsequently contacted by a reactant feedstock comprising in the absence of a reactant feedstock,

a. loading finely divided catalyst particulate matter having a diameter from about one sixty-fourth to about one-half inch into a reactor vessel having said fixed-bed for the purpose of increasing the packing density of said fixed-bed and without fluidizing said particulate matter which comprises the following steps:

b. introducing said finely divided particulate matter into the upper portion of said vessel uniformly across said vessel's cross-section at a particle flux of from about 300 to about 1,000 $lb/hr\text{-}ft^2$;

c. introducing an inert, non-reactant fluid medium uniformly

across said vessel's cross-section and counter-current to the flow of said finely divided particulate matter and at a rate insufficient to fluidize said particulate matter;

d. adjusting the flow of said fluid medium to continuously maintain a constant velocity differential between said fluid medium and the falling finely divided particulate matter which velocity differential is at least as great as the free-fall terminal velocity of said finely divided particulate matter.

4,051,020

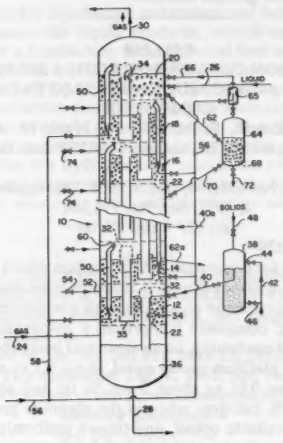
HYDROCARBON CONVERSION PROCESS FOR REMOVING SULFUR AND NITROGEN WITH PASSAGE OF CATALYST PARTICLES IN A SERIES OF SPACED BEDS

Gerald W. G. McDonald, Summit, N.J., assignor to Commonwealth Oil Refining Co. Inc.

Division of Ser. No. 627,127, Oct. 30, 1975. This application June 14, 1976, Ser. No. 695,398

Int. Cl.[2] C10G *23/00*

U.S. Cl. 208—213 **7 Claims**



1. A hydrocarbon conversion process for removing sulfur and nitrogen from hydrocarbon oil; comprising introducing into a mulit-stage reactor a liquid hydrocarbon oil adjacent the top of said reactor and withdrawing liquid product from the bottom of said reactor, introducing a hydrogen-rich gas adjacent to the bottom of said reactor and withdrawing gaseous reaction and unreacted hydrogen from the top of said reactor, maintaining a series of spaced beds of suspended catalyst particles within said reactor, maintaining desired liquid levels of oil within each of said beds to provide suspension of catalyst particles in said oil, passing said liquid oil from one bed to the next lower bed, and separately passing said catalyst particles from one bed to the next adjacent bed.

4,051,021

HYDRODESULFURIZATION OF HYDROCARBON FEED UTILIZING A SILICA STABILIZED ALUMINA COMPOSITE CATALYST

Glen P. Hamner, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Linden, N.J.

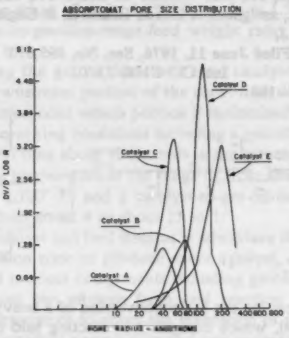
Filed May 12, 1976, Ser. No. 685,500

Int. Cl.[2] C10G *23/02*

U.S. Cl. 208—216 **6 Claims**

1. A process for the hydrodesulfurization of a hydrocarbon feed which comprises

contacting said feed with hydrogen and a catalyst characterized as comprising a composite of an alumina support stabilized with up to 6% silica and from about 5 to about 30 percent by weight of a Group VIB metal, metal oxide or metal sulfide thereof and from about 1 to about 12 percent by weight of a Group VIII metal, metal oxide or



metal sulfide thereof, the percents by weight being calculated on said composite, said catalyst being further characterized as follows:

Distribution of Pore Diameter measured by nitrogen adsorption isotherm	
0 - 50A	<1
50 - 70A	<24
70 - 160A	>70
160 + 200A	<5
200A +	
Pore Volume, cc/g	0.4 - 0.9
Surface Area, m^2/g	200 - 400

4,051,022

SYNTHETIC OIL TREATMENT

Gary A. Myers, Plano, and Donald K. Wunderlich, Richardson, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 421,139, Dec. 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 314,015, Dec. 11, 1972, abandoned. This application July 18, 1975, Ser. No. 597,297

Int. Cl.[2] C10G *29/04, 25/00*

U.S. Cl. 208—253 **3 Claims**

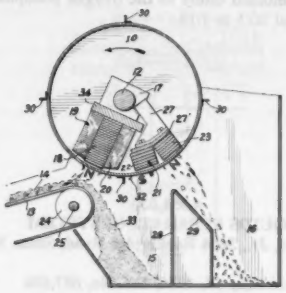
1. A method for removing at least one non-metallic impurity selected from the group consisting of arsenic and selenium from a synthetic hydrocarbonaceous liquid obtained from normally solid coal, oil shale, or tar comprising contacting said liquid with a solid co-precipitated material consisting essentially of aluminum, oxygen, and a metal selected from the group consisting of iron and cobalt; said co-precipitated material being in subdivided form; and carrying out said contacting of said liquid and said co-precipitated material in a hydrogen atmosphere at a temperature of at 300° F and in the substantial absence of water, said substantial absence of water being less than 1.0 percent by weight of water in said liquid, and effecting deposition of said at least one non-metallic impurity on said co-precipitated material.

4,051,023

COMBINATION ELECTROMAGNET AND PERMANENT MAGNET SEPARATOR

Robert E. Fogle, and James Floros, both of Erie, Pa., assignors to Eriez Magnetics, Erie, Pa.

Filed Apr. 11, 1975, Ser. No. 567,420
Int. Cl.[2] B07C 9/00; B03C 1/22
U.S. Cl. 209—223 A 8 Claims



1. A magnetic separator comprising a generally cylindrical drum made of a non-magnetic material,
means to rotate said drum around its longitudinal axis,
conveyor means for moving material past said drum,
a first chute for receiving non-magnetic material discharged from said conveyor means,
a second chute for magnetic material,
said first chute being disposed between said second chute and said conveyor means, a chute partition disposed between said first and second chutes,
said drum having a support means on its central axis disposed on the inside of said drum fixed against rotation,
an electromagnet supported on said support means,
said electromagnet extending radially from said support means and terminates adjacent the inner periphery of said drum,
said electromagnet having a pole at a position between a vertical line passing through an upper end of said conveyor and a vertical line passing through said chute partition, and a permanent magnet supported on said support means and disposed adjacent said second chute,
said conveyor comprising a belt means supporting said belt for movement around a closed path,
said path having an upper part and a lower part,
said upper part passing through the field generated by said electromagnet,
said permanent magnet comprises a back bar and a ceramic magnet fixed to said back bar.

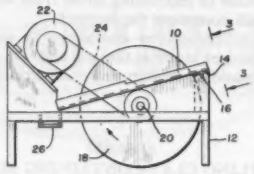
4,051,024

OIL RECOVERY APPARATUS AND METHOD

John G. Lowe, Pequannock, and Roy I. Butler, Kinnelon, both of N.J., assignors to Lowe Engineering Company, Lincoln Park, N.J.

Filed Jan. 29, 1976, Ser. No. 653,501
Int. Cl.[2] B01D 15/02, 15/06
U.S. Cl. 210—30 A 16 Claims

1. An oil recovery apparatus which removes oil, petroleum and like contaminating products as they float on or near the surface of a contaminated fluid, the apparatus including: (a) a support frame; (b) a multiplicity of substantially like-sized disks rotatably carried on and by said frame and when the frame is in operative use and position these disks are supported and rotated so as to be partially immersed in the contaminated fluid with the oil in the contaminated fluid contacting the side surfaces of the immersed disk, these side surfaces of the disks having an affinity for retaining oil and oil products and as the disks are rotated the floating oil in the contaminated fluid is attracted to the sides of the disk sufficiently for the oil to be lifted from the contaminated fluid; (c) a scraper assembly including at least one flexible ribbon associated with each disk, said scraper assembly providing a support for the flexible ribbon which during a portion of the supported length is bent so as to extend in a plane which is slightly upward from a plane parallel to the axis of the disk when the scraper assembly is in mounted scraping condition, the ribbon portion is arranged to provide at least one extending portion of ribbon which when in engaged condition with the disk is bent to provide a bias causing the edge of the extending portion of this ribbon to snugly engage the side of a disk to scrape the side of said rotating disk to remove the collected oil prior to the re-entry of the disk into the contaminated fluid, said scraper assembly including at least one tubular conductor which provides at least a portion of the



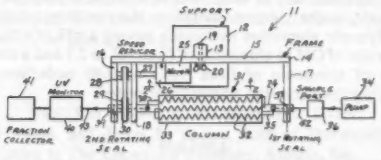
scraper support, said scraper assembly being readily removable from the support frame and in mounted condition the tubular conductor is sloped so that the discharge exit is below that portion having the scraper ribbons, this scraper assembly arranged so that one end rests on the support frame and is positively positioned at and in a selected orientation, this scraper assembly in mounted condition presenting the extending portion of the ribbon to the side of the rotating disk after the disk has reached its zenith and is on its downward movement prior to its re-entering the contaminated fluid, the conductor which is associated with each blade is adapted to receive the scraped oil from the disk and conduct the oil to a discharge end; (d) an accumulator adapted to receive the oil from the conductors and collect the accumulation for further disposition, and (e) power means associated with the disks and adapted to turn these disks in a prescribed direction and at a selected speed.

4,051,025

PREPARATIVE COUNTERCURRENT CHROMATOGRAPHY WITH A SLOWLY ROTATING HELICAL TUBE ARRAY

Yoichiro Ito, Bethesda, Md., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Sept. 29, 1976, Ser. No. 727,864
Int. Cl.[2] B01D 15/08
U.S. Cl. 210—31 C 12 Claims



1. An apparatus for continuous countercurrent chromatography comprising a support, frame means pivoted to said support for rotary adjustment around a transverse horizontal axis, a separation column comprising a helical tube array and journalled on said frame means for rotation around an axis perpendicular to said horizontal pivotal axis, drive means on said frame means drivingly connected to said separation column for rotating the column, feed conduit means for introducing fluids to one end of said separation column, fluid monitoring means,

and delivery conduit means connecting the other end of said separation column to said fluid monitoring means.

4,051,026

RECOVERY OF SILVER FROM SILVER-CONTAINING SOLUTIONS

Adrien Edgard Henri Julien Cremers, Winksele; André Petrus Adolf Maes, Kessel-LO, and Jozef Leonia Pleysier, Rijkevorsel, all of Belgium, assignors to Leuven Research & Development VZW, Leuven, Belgium

Filed Oct. 28, 1975, Ser. No. 626,052

Claims priority, application Netherlands, Oct. 29, 1974, 7414149

Int. Cl.² C02B *1/42*

U.S. Cl. 210—38 B **13 Claims**

10. The process of recovering silver from silver-containing solutions, which comprises the steps of:

a. forming silver-thiourea complexes in said solution by adding thiourea material thereto; and

b. adsorbing said silver-thiourea complexes on a cation exchanger.

4,051,027

SETTLING CLAY-CONTAINING SLIMES

Othmer F. Batzer, and John A. Stewart, both of Libertyville, Ill., assignors to International Minerals & Chemical Corporation, Libertyville, Ill.

Filed Dec. 22, 1975, Ser. No. 643,446

Int. Cl.² C02B *1/20*

U.S. Cl. 210—42 R **5 Claims**

1. A process for settling waste slime solids, from a phosphate are processing operation, including suspended attapulgite, montmorillonite, and fine sand from an aqueous suspension thereof, wherein said suspension contains from about 0.01% to about 35% by weight of solids, which comprises the steps of adding hydrogen peroxide to said suspension in an amount to enhance the settling of said solids, said amount being at least about 2 pounds per ton of suspended solids, and settling said solids from said suspension.

4,051,028

PROCESS FOR PURIFYING WATER

Francois Marie Fiessinger, Paris, France, assignor to Degremont, Rueil-Malmaison, France

Filed Apr. 26, 1976, Ser. No. 680,842

Claims priority, application France, Apr. 25, 1975, 75.12975

Int. Cl.² C02B *1/20*

U.S. Cl. 210—47 **7 Claims**

1. A process for purifying water containing material dissolved and/or suspended therein, which comprises mixing the water with an effective amount of a solution of a polymeric aluminum hydroxide prepared by treating a solution containing up to 2.5 moles/liter of aluminum chloride with a solution consisting essentially of water and an alkaline or alkaline-earth hydroxide, under vigorous agitation, the resulting solution of the polymeric aluminum hydroxide having a pH of 4.5–5.5, a molar ratio of OH to aluminum of from 2.3 to 2.7 and a concentration of aluminum of from 0.025 to 0.40 mole/liter, and separating floc from the thus treated water.

4,051,029

PROCESS OF INHIBITING SCALE FORMATION WITH MIXTURES OF THIO-, OXYGEN OR THIO-OXYGEN PHOSPHATES AND PYROPHOSPHATES

Derek Redmore, Ballwin, and Alfred E. Woodson, Festus, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 272,676, July 17, 1972, Pat. No. 3,909,447.

This application June 26, 1975, Ser. No. 590,448

Int. Cl.² C02B *5/06*

U.S. Cl. 210—58 **14 Claims**

1. A process of inhibiting scale formation in a system which comprises treating said system with a composition comprising a mixture of thiophosphate, pyrophosphate containing both oxygen and sulfur, and oxygen phosphate esters of alcohols selected from the group consisting of alkanols having at least seven carbon atoms and alcohols of the formula $R'(OA)_nOH$ where R' is alkyl, cycloalkyl, alkenyl, aryl, aralkyl, alkaryl, or heterocyclic, A is an alkylene moiety and *n* is from 1 to 100, said pyrophosphate esters being the major part of the combined thiophosphate and pyrophosphate esters and the weight ratio of said combined esters to the oxygen phosphate esters being from about 10:1 to 1:10.

4,051,030

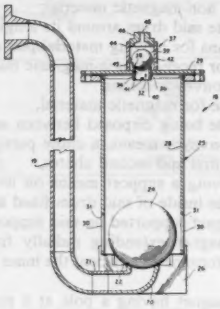
LIQUIDS SEPARATING SYSTEM

George E. Huiet, Jr., 3664 Rockbridge Road, Stone Mountain, Ga. 30083

Filed May 18, 1976, Ser. No. 687,550

Int. Cl.² B01D *21/24*

U.S. Cl. 210—114 **5 Claims**

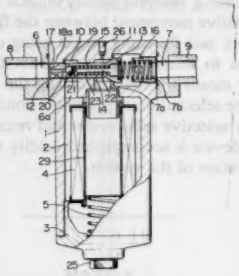


1. Apparatus for draining heavy liquid from a tank which contains both heavy and light liquids comprising a flow passage communicating between outside the tank and inside the tank and valve means in open communication with the liquids in the tank, said valve means comprising a valve seat and a valve element arranged to engage said valve seat to open and close said flow passage, said valve element comprising a float valve with a specific gravity less than the heavy liquid and greater than the light liquid, and said valve means further including a valve housing positioned over said valve seat for confining said float valve to substantially vertical movement toward and away from said valve seat, said valve housing defining openings at its lower portion and being closed in its upper portion, an upper flow passage defined in the upper portion of said valve housing and an upper valve seat and an upper valve element arranged to engage said upper valve seat to open and close said upper flow passage, whereby when the level of the heavy liquid rises in the tank the heavier liquid displaces the lighter liquid up through the upper valve element and fills the valve housing and when the level of the heavy liquid recedes in the tank below the upper valve element the upper valve element closes and traps the heavier liquid in the valve housing and maintains the float valve high in the valve housing away from the valve seat as the heavy liquid continues to recede in the tank until the light liquid flows through the openings in the lower portion of the valve housing and displaces the heavy liquid in the valve housing and allows the float valve to move down against the valve seat.

4,051,031
FILTER APPARATUS

Eiji Suzuki, Tokyo, Japan, assignor to Taisei Kogyo Co., Ltd., Japan

Filed June 25, 1975, Ser. No. 590,122
Claims priority, application Japan, Nov. 20, 1974, 49-140270[U]; Mar. 24, 1975, 50-39285[U]
Int. Cl.² B01D 27/10
U.S. Cl. 210—133 4 Claims

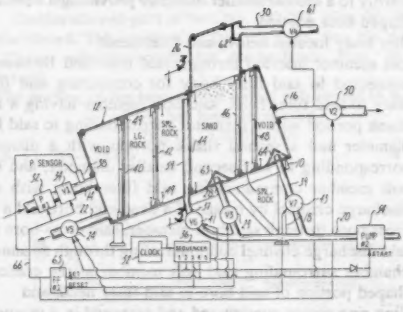


1. A filter device comprising, a filter casing, having a filter element chamber for removably housing a filter element therein, said housing having an inlet with a valve seat and an inlet passageway communicating with said inlet and said chamber, means defining a second passageway outwardly of said chamber for passage of fluid from a filter element therein outwardly of said housing, means defining a second set circumferentially of said second passage upstream of an outlet of said second passageway from said casing, an elongated valve element slidable axially in said second passageway in response to fluid under pressure in said second passageway having a portion biased to seat on said second seat and close said second passageway, biasing means biasing said valve element in a direction for seating on said seat and closing said second passageway, and said valve element comprising a second portion axially of the first portion thereof and integral therewith for seating on the first-mentioned seat for closing said inlet passageway.

4,051,032
WATER TREATMENT SYSTEM

Jack A. Borchardt, Ann Arbor, Mich., assignor to Environmental Filtration Products, Inc., Orlando, Fla.

Filed May 21, 1976, Ser. No. 688,558
Int. Cl.² B01D 23/24
U.S. Cl. 210—142 16 Claims

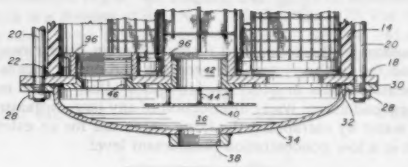


12. A waste effluent treatment system comprising: a closed tank having an effluent inlet at one end and an effluent outlet at an opposite end to provide an effluent flow path substantially horizontally through the tank; a plurality of septa disposed in spaced relation within the tank to subdivide the tank into subchambers serially along the effluent flow path; a fine particulate medium in at least one of the subchambers to filter the effluent; a coarse particulate medium in another subchamber and upstream in the effluent flow from said one subchamber; first means for horizontally backwashing at least the coarse medium; and second means for vertically backwashing and expanding the fine medium in said one subchamber.

4,051,033
FILTER DEVICE

Roy J. Biace, Wallingford, Conn., assignor to Biace Filtronics, Inc., Derby, Conn.

Filed Dec. 22, 1975, Ser. No. 643,594
Int. Cl.² B01D 23/04
U.S. Cl. 210—193 11 Claims



1. Filter apparatus for internal precoat of filter bags, and for fluid flow respectively in an upward and downward direction for filtering fluid and providing backwash cleaning of said apparatus, said apparatus comprising an upright housing having sidewalls, a top cover with an outlet for filtered fluid located therein, a bottom cover with an inlet for fluid to be filtered located therein, a horizontally arranged bottom wall located in a lower portion of said housing and spaced above said bottom cover, circular openings located in said bottom wall with short tubular flange sections located at said openings and extending upwardly therefrom, vertically extending rod members constructed and arranged to define a vertical skeleton tube surrounding each of said tubular flange sections, a flexible tubular filter bag with a closed top, sidewalls, and an open bottom surrounding each of said skeleton tubes, the lower edge of the sidwall of each bag sealingly connected to the tubular flange section which it surrounds, perforate frame means surrounding the exterior surface of each of said filter bags with clamp means arranged at the lower edge thereof as fastening means connecting said exterior frame, said filter bag, and said skeleton tube to the exterior surface of its corresponding tubular flange, filter aid media supply means connected to said bottom cover inlet whereby it may be introduced to the interior of each of said filter bags by a pressurized source of fluid to be filtered, backwash means in fluid communication with said top cover outlet whereby backwash of said filter bags occurs in a direction from the exterior to the interior through their sidewalls with discharge of washed material through said bottom cover inlet opening.

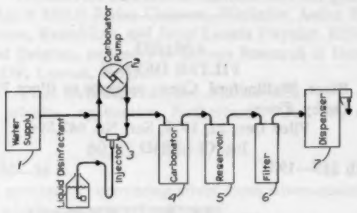
4,051,034
SYSTEM FOR WATER DISINFECTION

Anton Amon, and Jason K. Sedam, both of Dunwoody, Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Division of Ser. No. 398,373, Sept. 18, 1973, abandoned. This application May 28, 1975, Ser. No. 581,510
Int. Cl.² C02B 1/36
U.S. Cl. 210—206 8 Claims

1. A carbonated beverage system of the type including a water supply means, a closed system carbonator means, and a beverage dispenser means fluidly and operatively connected together in said system, wherein said water supply means sequentially supplies water initially to the carbonator means and thereafter to the dispenser means, and further wherein, the

improvement comprises liquid halogen-based disinfectant injection means connected to said carbonator means for, at substantially the same time of operation of said carbonator means, injecting a sufficient amount of liquid halogen-based disinfectant into the water being carbonated in a closed system, and thus, produce rapid disinfection of any pathogenic micro-



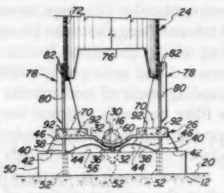
organisms in the water, and further wherein filter means are connected in the system between the carbonator means and dispenser means in order to provide a safety factor in the system and assure water disinfection of any large organisms in the water by entrapping the large organisms for an extended time in a low concentration disinfectant level.

4,051,035

APPARATUS FOR THE AEROBIC TREATMENT OF LIQUID WASTE

William O. Boschen, Cliffside Park; Angelo V. Annichiarico, East Hanover, and Arthur L. Johnson, Lodi, all of N.J., assignors to Ralph B. Carter Company, Hackensack, N.J.

Filed Aug. 16, 1976, Ser. No. 714,849
Int. Cl.² C02C *1/12*; B01F *3/04*
U.S. Cl. 210—220 **24 Claims**



1. In a system for the aerobic treatment of waste materials in a liquid basin, the system including gas distribution lines in an array of continuous lines having a plurality of orifices placed therein for releasing gas, such as air, to the liquid in the basin during operation of the system, and a mixer-aerator device for placement in position over any one of the orifices for enhancing the mixing and aerating of the liquid in the region adjacent that position, the improvement comprising:

a plurality of brackets capable of being placed within the basin in a pattern corresponding to the array of continuous lines;

means for attaching the continuous lines to the brackets at spaced locations along the continuous lines without interrupting the continuity of the continuous lines, at least some of the locations corresponding to the placement of the orifices;

selective means integral with each bracket and the mixer-aerator device for securing the mixer-aerator device upon a selected bracket in a rigid, self-supporting manner, over a line and the orifice placed at the location of the selected bracket, the selective means being capable of ready operation for selectively securing the mixer-aerator device to the selected bracket and selectively removing the mixer-aerator device from the selected bracket, said selective means including:

at least two rigid legs extending between the mixer-aerator device and the selected bracket, the legs each having opposite ends;

a foot adjacent at least one of the opposite ends of each leg;

receptor means for each foot, the location of the receptor means corresponding to the location of each foot when the mixer-aerator device is in place upon the selected bracket; and

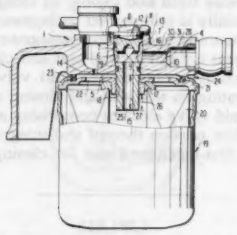
fastening means for selectively securing each foot with the corresponding receptor means in such manner as to preclude relative movement between the foot and the receptor means, said fastening means being capable of manual operation to release each foot from the corresponding receptor means without disturbing the attachment of the line to the selected bracket and the continuity of the array whereby selective securement and removal of the mixer-aerator device is accomplished readily without disturbing the operation of the system.

4,051,036

FILTER FOR LIQUIDS

Ulrich Conrad, Ludwigsburg, and Gerd Niemeier, Stuttgart, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Feb. 3, 1976, Ser. No. 654,909
Claims priority, application Germany, Feb. 7, 1975, 2505091; June 7, 1975, 2525526
Int. Cl.² B01D *27/08*
U.S. Cl. 210—232 **10 Claims**



1. A filter for liquids comprising:

a filter head including an inlet channel, a discharge channel, and a bore extending downwardly through said filter head, said bore having a first diameter tapering downwardly to a second smaller diameter providing a conically shaped bore portion;

a filter body located below said filter head;

a bolt member inserted through said bore and threadedly connected to said filter body for connecting said filter body to said filter head, said bolt member having a first shank portion with a diameter corresponding to said first diameter and a second shank portion with a diameter corresponding to said second smaller diameter, and said bolt member communicating said filter body with said discharge channel by means of a dead-end bore and a full cross-bore through said bolt member, said cross-bore and said discharge channel communicating through an annular chamber surrounding said bolt member at the conically shaped portion of said bore in said filter head; and

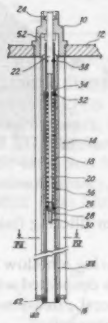
sealing ring means constructed and arranged in a groove in said second smaller diameter shank portion of said bolt member for sealing said downwardly extending bore in said filter head, whereby said sealing ring means is inwardly compressed in said groove by the conically shaped portion of said bore upon insertion of said bolt member into said bore.

4,051,037

DEVICE FOR ASSEMBLING STACKED ANNULAR FILTERING ELEMENTS, UNDER CONSTANT PRESSURE

Michel Billault, Limoges, France, assignor to Sofrance S.A., Limoges, France

Filed Oct. 7, 1976, Ser. No. 730,177
Claims priority, application France, Oct. 16, 1975, 75.31678
Int. Cl.[2] B01D *25/04*
U.S. Cl. 210—236 11 Claims



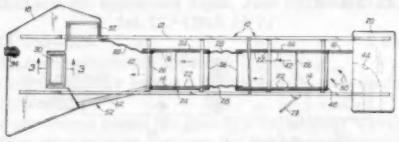
1. A device for the assembly of stacked annular filtering elements under constant pressure for filtering a fluid flowing through the stack of elements from the outside thereof to the inside thereof, the device comprising a support which provides an abutment for one end of the stack of elements, a presser member which provides an abutment for the other end of the stack of elements, and a calibrated spring acting to bias the presser member towards the support such that said abutments are pushed one towards the other thus trapping the stack of elements therebetween, said spring being housed inside a tube located inside the stack of elements, one end of the tube being connected to the presser member and the other end of the tube being mounted to slide in a sealed manner on a securing member connected to the support, whereby the spring cannot contact the filtered fluid leaving the inside of the stack of elements.

4,051,038

FLOW CONTROL VANE FOR A SKIMMER-TYPE OIL BOOM

Cornelis in't Veld, Vlaardingen, Netherlands, assignor to National Marine Service, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 527,293, Nov. 26, 1974, abandoned. This application Dec. 22, 1975, Ser. No. 643,170
Claims priority, application Netherlands, Nov. 26, 1973, 7316165
The portion of the term of this patent subsequent to Sept. 7, 1993, has been disclaimed.
Int. Cl.[2] E02B *15/04*
U.S. Cl. 210—242 S 4 Claims



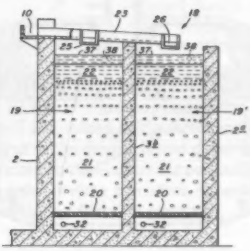
1. In an oil boom including a pair of longitudinally extending and generally parallel surface barriers constituting a forward and rear barrier and a longitudinally extending surface space therebetween, the forward barrier being shorter than the rear barrier at one end, and an end closure for the said space at said one end being connected to the rear barrier and extending forwardly so as to define a surface bypass area between said end closure and the adjacent end of said forward barrier, the improvement comprising a fixed flow control vane extending generally longitudinally of said forward barrier and between said forward barrier and said end closure, said vane including an upright, relatively narrow and elongated central web section extending longitudinally of the vane, the web section being forwardly inclined and disposed so as to lie beneath the surface of a body of water in which the boom is afloat by a predetermined distance.

4,051,039

ACTIVATED SEWAGE PLANT AND PROCESS

Donald F. Heaney, Pittsburgh, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 301,262, Oct. 27, 1972, abandoned, which is a division of Ser. No. 2,103, Jan. 12, 1970, Pat. No. 3,713,543, which is a continuation-in-part of Ser. No. 761,616, Sept. 23, 1968, abandoned. This application Apr. 26, 1976, Ser. No. 680,421
Int. Cl.[2] B01D *23/16*
U.S. Cl. 210—274 3 Claims



1. A filter especially designed for use in filtering the effluent flowing from the settling tank of an activated sewage plant to a clearwell and chlorinating vessel having an effluent discharge comprising:

a. a vessel having a bottom and side walls and having a perforate false bottom spaced above the bottom,

b. a filter bed not less than 6 feet in depth supported on said false bottom and comprised of hard gravel-like quartz sand, the particles of which are rounded and non-angular and in the general size ranging between 1 mm and 3 mm in the greatest dimension and with the particles in the bed predominantly varying from one another but not substantially more than 1 mm, said filter having a valved discharge outlet from the space below the false bottom for the collection of filtered water, said filter having means for forcing air under pressure into the space under the false bottom when said valved outlet is closed, said filter having means for forcing backwash water into the space under the false bottom when air is also being forced into said space, said filter having a head space above the filter bed for receiving water to be filtered and having an overflow weir into which water flows when the water is being backwashed.

4,051,040

ANTITHROMBOGENIC HEMO DIALYSIS MEMBRANES

James J. Hazdra, Downers Grove; David J. Rausch, Naperville, both of Ill., and Karl O. Munninger, North Las Vegas, Nev., assignors to John L. Hutchinson, Wheaton, Ill., a part interest

Filed Mar. 17, 1976, Ser. No. 667,539
Int. Cl.[2] B01D *13/00*
U.S. Cl. 210—321 B 4 Claims

1. An artificial kidney machine having a hemo dialysis cellulosic membrane containing alkali carboxymethylation to the

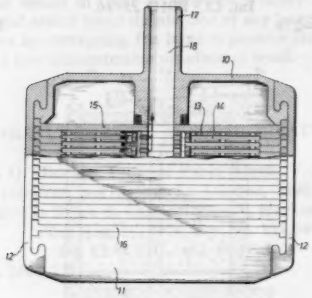
extent of about 5 – 12 percent of that alkali carboxymethylation which may be theoretically incorporated in said membrane.

4,051,041

DEVICE FOR DIFFUSION OF SUBSTANCES BETWEEN TWO FLUIDS THROUGH SEMIPERMEABLE MEMBRANES

Gerhard Riede, Eslov, Sweden, assignor to Gambro AG, Switzerland

Continuation of Ser. No. 446,265, Feb. 27, 1974, abandoned. This application July 2, 1975, Ser. No. 592,666
Claims priority, application Sweden, Mar. 21, 1973, 7339489
Int. Cl.² B01D *31/00*
U.S. Cl. 210—321 B **7 Claims**



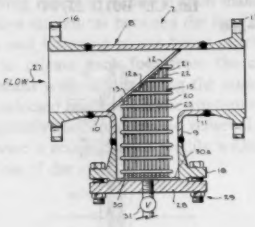
1. A device for diffusion of substances between two liquids through semipermeable membranes comprising a plurality of spacer elements each having inlet and outlet openings at opposed ends thereof, said inlet and outlet openings being aligned when said spacer elements are arranged in stacked relation, said spacer elements having recessed portions on opposite sides thereof spaced from the inlet and outlet openings and extending between said openings, pairs of membranes disposed between each of said spacer elements and provided only with inlet and outlet openings at opposed ends thereof coinciding with the inlet and outlet openings in said spacer elements when arranged in stacked relation, a first liquid being passed between the membranes of each pair and a second liquid being passed over the outer surfaces of each membrane and through the recessed portions of adjacent spacer elements, each spacer element having at least one first recessed groove on one side thereof extending away from an opening, a first transverse passage extending between the outer end of said at least one first recessed groove on the one side and the opposed side of said spacer element, a second recessed groove on the opposed side of said spacer element extending from the first transverse passage to the recessed portion on the opposed side of said spacer element and a second transverse passage extending between the outer end of the second recessed groove and the one side of said spacer element for communicating with the recessed portion on the one side of said spacer element, the surface of each spacer element adjacent to and surrounding said at least one first recessd groove, the opening and said first transverse passage forming a continuous seal with the adjacent surface of the superposed spacer element with a pair of membranes therebetween when said spacer elements and pairs of membranes are clamped together in alternate stacked relation to prevent leakage of the second liquid from the at least one first recessed groove into the first liquid passing between the membranes of each pair.

4,051,042

FLUID FLOW FILTERING ARRANGEMENT

Leo D. Tullier, 4727 Bayou Vista, Houston, Tex. 77018, and John F. Vignone, 8282 61 Drive, Flushing, N.Y. 11379

Filed Dec. 15, 1975, Ser. No. 641,099
Int. Cl.² B01D *21/02*
U.S. Cl. 210—409 **18 Claims**



1. An arrangement for filtering fluid flow in a conduit comprising:

a. a T connection having a hollow body including a hollow projection which is connected with and intersects a pair of aligned hollow lateral extensions for forming a flow passage through the connection;

b. flange means formed on said hollow projection;

c. a plate secured in said T connection to intersect the flow passage, said plate having an opening therein;

d. a hollow, annular filter member positioned in said hollow projection and extending into the flow passage, said filter member including:

1. a core formed of spaced strips;

2. said strips having a surface for receiving the flow of fluid;

3. said strips having converging side surfaces extending from said fluid receiving surface whereby the space between said spaced strips is smallest adjacent the fluid receiving surface; and

4. a plurality of spaced reinforcing ribs engaging said spaced strips;

e. said filter member having an end positioned to communicate with the opening in said plate for receiving fluid flow in said filter member;

f. closing means for closing the other end of said filter member; and

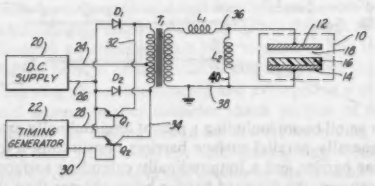
g. retaining means secured to said flange means to retain said filter member in position in said hollow projection.

4,051,043

APPARATUS FOR FLUID TREATMENT BY ELECTRON EMISSION

Joseph William Harter, Los Angeles, and Stuart Wallace Beitzel, Santa Monica, both of Calif., assignors to O-3 Company, Los Angeles, Calif.

Filed Jan. 26, 1976, Ser. No. 652,633
Int. Cl.² C01B *13/11*
U.S. Cl. 250—531 **13 Claims**



1. An apparatus for treating a fluid by electron emission, said apparatus including a cell for fluid treatment by electron emis-

sion and a circuit means for supplying an alternating current to said cell in which the improvement comprises:

said circuit means including power supply means for supplying electric power to the terminals of said cell,

said circuit means also including means for interrupting power flow from said power supply means to said cell for an interval during each cycle of said alternating current, energy storage means shunted across the terminals of said cell for storing energy when power is supplied to said cell said energy storage means being capable of supplying the energy stored therein to said cell upon the reversal of the polarity of said cell.

4,051,044

ELECTRIC DISCHARGE SURFACE TREATING APPARATUS

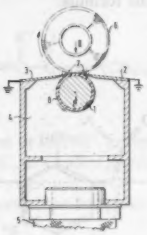
Bent Sörensen, Lunderskov, Denmark, assignor to Softal Elektronik Erik Blumenfeld KG, Hamburg, Germany

Filed Dec. 29, 1975, Ser. No. 644,411

Claims priority, application Germany, Dec. 30, 1974, 2461865

Int. Cl.[2] B01K *1/00;* H01T *19/04*

U.S. Cl. 250—531 **5 Claims**



1. Apparatus for the treatment of the surface of an object of conductive or non-conductive material by raising the surface energy thereof, comprising:

means defining a first rotatable cylindrical electrode with a surface adapted to lie along the surface of the object, a second knife-like electrode with the edge thereof lying along said surface of said cylindrical electrode in closely spaced relation to define a discharge gap between the electrodes, the knife-like electrode lying substantially tangentially to the cylindrical electrode,

object-supporting means adapted to maintain such an object in contact with said surface of said first cylindrical electrode, and

means for providing a flow of gas through the discharge gap between the electrodes.

4,051,045

OZONE GENERATING APPARATUS

Yoshihiko Yamamoto; Masahiro Shigenobu, and Hideo Kuwabara, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 14, 1975, Ser. No. 577,455

Claims priority, application Japan, June 10, 1974, 49-66222

Int. Cl.[2] C01B *13/11*

U.S. Cl. 250—536 **8 Claims**

1. An ozone generating apparatus comprising:

an ozone generator having a discharge tube with discharge electrodes;

a power source means for feeding a rectangular waveform alternating current between the discharge electrodes of the ozone generator;

a forward converter;

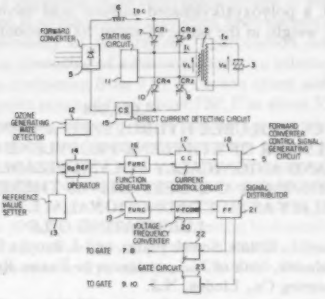
a reverse converter for converting the direct current of the forward converter to alternating current;

an ozone generating rate detector for detecting the ozone generating rate of the ozone generator to generate a signal proportional to the ozone generating rate;

an adder for comparing the output of the detector with a reference value;

first and second function generators to receive the output of the adder with each output having predetermined characteristics;

a direct current detecting circuit for detecting DC output



current fed from the forward converter to the reverse converter;

a forward converter control circuit for controlling the output current of the forward converter depending upon a comparison of the output of the first function generator with the output of the direct current detecting circuit; and

a reverse converter control circuit for controlling the output frequency of the reverse converter depending upon the output of the second function generator.

4,051,046

DETERGENT COMPOSITIONS CONTAINING INSOLUBLE PARTICULATE MATERIALS HAVING FABRIC CONDITIONING PROPERTIES

Francis Louvaine Diehl, Wyoming, and James Byrd Edwards, Roselawn, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 357,128, May 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 333,103, Feb. 16, 1973, Pat. No. 3,892,681. This application July 10, 1975, Ser. No. 594,909

Int. Cl.[2] C11D *3/12, 3/14;* D06M *11/12*

U.S. Cl. 252—8.6 **1 Claim**

1. A detergent composition in particulate form having fabric conditioning properties, consisting essentially of:

a. from about 2% to about 99.5% by weight of an organic surface-active agent selected from the group consisting of anionic, nonionic, zwitterionic and ampholytic detergents and mixtures thereof; and

b. from about 0.05% to about 10% by weight of a substantially water-insoluble particulate material having:

i. an average particle size in the range from about 5 to about 30 micrometers;

ii. a shape having an anisotropy of about 5:1 to 1:1;

iii. a hardness of less than about 5.5 on the Moh scale;

iv. a melting point above about 150° C; and

v. substantial freedom from exchangeable calcium and magnesium ions,

said water-insoluble particulate material being selected from the group consisting of glass beads, glass beads, glass microballoons, ceramic beads, and mixtures thereof.

4,051,047

GROUP II METAL MIXED SALTS OF TWO DIFFERENT ORGANIC ACIDS IN LUBRICANT

Thomas V. Liston, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 24, 1976, Ser. No. 670,515
Int. Cl.[2] C10M *1/40, 3/34, 5/22, 7/38*
U.S. Cl. 252—33 **17 Claims**

1. A Group II metal salt of:

A. an oil-soluble hydrocarbyl sulfonic acid; and

B. a polyoxyalkylenated sulfuric acid having a molecular weight in the range of about 500 to about 5000.

4,051,048

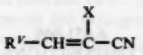
OIL-SOLUBLE HYDROLYZED ANIONIC-GRAFT POLYMER OF ETHYLENE-PROPYLENE COPOLYMER AND ANIONICALLY POLYMERIZABLE NITRILE MONOMER AND DERIVATIVES THEREOF HAVING UTILITY AS MULTIFUNCTIONAL V. I. IMPROVER FOR LUBRICATING OILS

Robert L. Elliott, Scotch Plains, and J. Brooke Gardiner, Mountainside, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 680,077, April 26, 1976. This application Oct. 13, 1976, Ser. No. 732,143
Int. Cl.[2] C10M *1/32, 1/18*
U.S. Cl. 252—51.5 R **21 Claims**

1. An oil soluble hydrolyzed anionic-graft polymer having a number average molecular weight in the range of about 1,000 to 500,000 while containing in the range of about 0.005 to 2 wt. % nitrogen and being useful as an oil additive having dispersancy properties, said anionic-graft polymer being a graft polymer of:

1. an anionically polymerizable monomer containing in the range of about 3 to 24 carbon atoms and at least one electron withdrawing group in such proximity to an olefinic bond that said bond is activated, said monomer being a nitrile monomer of the formula:



wherein R^{y} is hydrogen or lower alkyl up to about 12 carbons, X is selected from the group consisting of hydrogen, halogen, cyano and lower alkyl up to 6 carbons; and,

2. an anion of an oxidized ethylene copolymer comprising about 20 to 80 mole % ethylene and about 20 to 80 mole % propylene; said anionic graft polymer being either acid or base hydrolyzed.

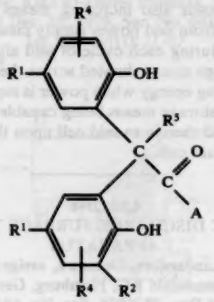
4,051,049

LUBRICATING OIL CONTAINING ALKANOIC AMIDE OR ESTER-BRIDGED HYDROCARBYL SUBSTITUTED PHENOLS

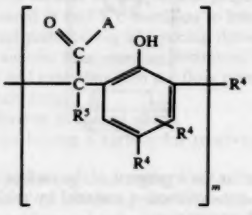
John Scotchford Elliott, Beaconsfield; Bryan Terence Davis, and Richard Martin Howlett, both of Wokingham, all of England, assignors to Edwin Cooper and Company Limited, Bracknell, England

Division of Ser. No. 462,092, April 18, 1974, Pat. No. 3,966,807. This application Mar. 15, 1976, Ser. No. 666,912
Claims priority, application United Kingdom, Apr. 19, 1973, 19173/73
Int. Cl.[2] C10M *1/32*
U.S. Cl. 252—51.5 A **10 Claims**

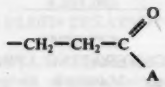
1. A lubricating composition comprising a major amount of a lubricating oil selected from synthetic ester oils, mineral oils and mixtures thereof and containing a minor dispersant amount of an additive having the formula:



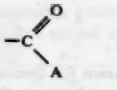
wherein each R^1 is the same or different and is a hydrogen atom or an alkyl group, provided that at least one R^1 is an alkyl group containing at least 30 up to about 200 atoms; R^2 is hydrogen or is a group of the formula:



in which *m* is zero or an integer; each R^4 is the same or different and is hydrogen or a group of the formula —Z—R^6 in which Z is a sulfur atom, a chain of at least two sulfur atoms or is absent and R^6 is an alkyl group, a hydroxy-substituted aralkyl group when Z is absent, a hydroxy-substituted aryl group or a hydroxy-substituted alkaryl group when Z is present; each R^5 is the same or different and is a hydrogen atom, a methyl group or the group:



and each



is the same or different and is selected from the group consisting of an amide group or is an ester group wherein said amide group has at least one hydroxyalkyl or aminoalkyl substituent attached to the nitrogen atom and said ester group is derived from an hydroxyethyl substituted amine.

4,051,050

OIL-SOLUBLE ANIONIC-GRAFT POLYMER OF ETHYLENE-PROPYLENE COPOLYMER AND ANIONICALLY POLYMERIZABLE MONOMER HAVING UTILITY AS MULTIFUNCTIONAL V. I. IMPROVER FOR LUBRICATING OILS

Robert L. Elliott, Scotch Plains, and John Brooke Gardiner, Mountainside, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

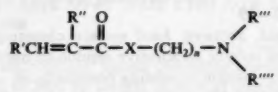
Filed Apr. 26, 1976, Ser. No. 680,077
Int. Cl.[2] C10M *1/36, 1/18*
U.S. Cl. 252—51.5 R 24 Claims

1. An oil soluble anionic-graft polymer having a number average molecular weight in the range of about 1,000 to 500,000 while containing in the range of about 0.005 to 2 wt. % nitrogen and being useful as an oil additive having dispersancy properties, said oil soluble polymer being a graft polymer of:

1. an anionically polymerizable monomer containing in the range of about 3 to 50 carbon atoms and at least one electron withdrawing group in such proximity to an olefinic bond that said bond is activated, said monomer being selected from the group consisting of:

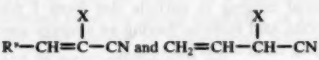
a. N,N (di $C_{1\text{-}10}$ hydrocarbyl) carbodiimides;

b. monomers of the formula:



wherein X is oxygen or an NR″ group; *n* is 2 to 5; R′ and R″ are hydrogen or a C_1 to C_4 alkyl group; and R‴ and R⁗ are C_1 to C_{12} hydrocarbyl groups; and

c. nitrile monomers of the formulae:



wherein R′ is hydrogen or lower alkyl and X is selected from the group consisting of hydrogen, halogen, cyano and lower alkyl;

and, (2) an anion of an oxidized ethylene copolymer comprising about 20 to 80 mole % ethylene and about 20 to 80 mole % propylene.

4,051,051

LUBRICATING OIL COMPOSITIONS CONTAINING AN ACYCLIC POLYMER OF CYCLOPENTENE

Frederik L. Binsbergen, and Dick J. Van Namen, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed June 21, 1976, Ser. No. 698,611
Claims priority, application United Kingdom, June 24, 1975, 26721/75
Int. Cl.[2] C10M *1/18*
U.S. Cl. 252—59 3 Claims

1. An oil composition comprising a lubricating oil and from 0.025 to 10%w of substantially linear polymer selected from the group consisting of an acyclic polymer of cyclopentene, acyclic polymers of cyclopentene which have been partially hydrogenated to remove less than 70% of the initial unsaturation of the acyclic polymer, and mixtures thereof, said linear polymer having a molcular weight of between 1.0×10^4 and 3.0×10^5.

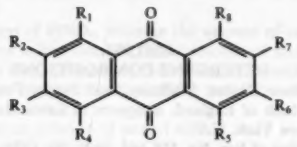
4,051,052

LIQUID DEVELOPER

Yasuo Ueda, Kobe; Yasutoki Kamezawa; Tatsuo Aizawa, both of Osaka, and Toshimitu Ikeda, Himeji, all of Japan, assignors to Mita Industrial Company Ltd., Osaka, Japan

Division of Ser. No. 32,733, April 28, 1970, Pat. No. 3,781,208. This application Oct. 25, 1973, Ser. No. 409,737
Int. Cl.[2] G03G *9/00*
U.S. Cl. 252—62.1 L 16 Claims

1. A liquid developer for electrophotography which consists essentially of a dispersion of an anthraquinone dye or pigment finely dispersed in an electrically insulating hydrocarbon liquid consisting essentially of isoparaffinic hydrocarbon selected from the group consisting of a mixture consisting substantially of isoparaffins containing from 9 to 11 carbon atoms and having a boiling point range of from about 320° F to about 350° F, a mixture consisting substantially of isoparaffins containing 8 to 12 carbon atoms and having a boiling point range of from about 345° F to about 375° F and a mixture consisting substantially of isoparaffins containing 9 to 14 carbon atoms and having a boiling point range of from about 354° F to about 386° F, and from 0 to 30% by volume of an aromatic hydrocarbon in which the anthraquinone dye or pigment is substantially insoluble said anthraquinone dye or pigment have the formula:



wherein R_1 to R_8 are selected from hydrogen, halogen, hydroxyl, amino, —SO_3M, in which M is hydrogen, an alkali metal or an alkaline earth metal, and a substituent of the group consisting of

a. an alkyl group,
b. an alkoxy group,
c. an alkylthio group,
d. an alkylamino group,
e. an alkylcarbonyl group,
f. an N-alkylcarbonamide group,
g. an N-alkylsulfonamide group,
h. an alkarylamino group,
i. an N-alkarylcarbonamide group,
j. an N-alkarylsulfonamide group,
k. an alkylbenzenesulfonamide group,
l. an alkylarylamino group,
m. an alkylamino-triazinylamino group, and
n. an alkaryloxy group,

each of the above groups (a) to (n) having 8 to 24 carbon atoms in the alkyl portion, and wherein 1 to 4 of R_1 to R_8 are substituents selected from the said groups (a) to (n);

and from 0 to 30% by volume of an aromatic hydrocarbon, the liquid developer containing 0.05 to 5 grams of said dye or pigment per liter of said liquid developer.

4,051,053

HYDRAULIC FLUIDS COMPRISING ORTHOSILICATE ESTERS

John Scotchford Elliott; Gerald John Joseph Jayne; Herbert Frank Askew, and Colin John Harrington, all of Swindon, England, assignors to Castrol Limited, England

Continuation of Ser. No. 431,889, Jan. 9, 1974, abandoned. This application Apr. 22, 1976, Ser. No. 679,440
Claims priority, application United Kingdom, Jan. 10, 1973, 01409/73
Int. Cl.[2] C07F *7/04;* C09K *3/00*
U.S. Cl. 252—78.3 13 Claims

1. An orthosilicate ester having the general formula:

wherein R^1 is selected from the group consisting of propylene glycol monoalkyl ether residues containing from 1 to 2 carbon atoms in the terminal alkyl group and tertiary alkyl groups; each of R^2, R^3 and R^4 is the same or different and is selected from the group consisting of ethylene and propylene glycol monoalkyl ether residues containing from 1 to 2 carbon atoms in the terminal alkyl group and tertiary alkyl groups, provided that when R^1 is a propylene glycol monoalkyl ether residue each of R^2, R^3 and R^4 are also propylene glycol monoalkyl ether residues; the total number of carbon atoms in R^1, R^2, R^3 and R^4 being at least 15 and at least one of R^1, R^2, R^3, and R^4 being a glycol monoalkyl ether residue.

11. A hydraulic fluid containing at least one compound as defined in claim **1.**

4,051,054

DETERGENT COMPOSITIONS

Charles Bloor Davies, Wallasey, and James Francis Davies, Wirral, both of England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 510,664, Sept. 30, 1974, abandoned. This application May 12, 1976, Ser. No. 685,597

Claims priority, application United Kingdom, Oct. 1, 1973, 45688/73

Int. Cl.² C11D *1/66, 3/10*

U.S. Cl. 252—89 R **12 Claims**

1. A solid detergent additive consisting essentially of from about 5% to about 55% by weight of a nonionic detergent compound absorbed onto finely divided calcium carbonate having a surface area of at least about 5 m^2/g.

9. A process for forming a detergent additive according to claim **1** comprising dissolving a nonionic detergent compound in a volatile solvent of water, diethyl ether or lower aliphatic alcohols, mixing the solution with finely divided calcium carbonate having a surface area of at least 5 m^2/g, and then evaporating the solvent from the mixture.

4,051,055

CLEANSING COMPOSITIONS

Toan Trinh, Sharonville, and Bruce Albert Yeazell, Springfield Township, Hamilton County, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 21, 1976, Ser. No. 753,070

Int. Cl.² C11D *3/04, 3/14, 3/395, 7/10*

U.S. Cl. 252—95 **11 Claims**

1. An aqueous, hard surface cleansing composition comprising:

a. from about 0.1% to about 50% of a compound which releases hypochlorite ions in aqueous solution;

b. from about 0.1% to about 30% of a mineral clay having a cation exchange capacity of at least 3 milliequivalents of cation per 100 grams of clay;

c. from 0% to about 25% of a surfactant which is compatible with hypochlorite;

d. from 0% to about 65% of a particulate abrasive having a paticle size of from about 1 to about 250 microns and a specific gravity of from about 0.2 to about 2.2;

e. from 0% to about 50% of a water-soluble, inorganic alkaline salt or mixture of such salts;

f. an amount of a source of soluble fluoride ions which provides at least 0.01% of fluoride ions to said composition; and

g. the balance of said composition comprising water.

4,051,056

ABRASIVE SCOURING COMPOSITIONS

William Law Hartman, Cheviot, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 504,217, Sept. 9, 1974, abandoned. This application Sept. 4, 1975, Ser. No. 610,220

The portion of the term of this patent subsequent to Oct. 12, 1993, has been disclaimed.

Int. Cl.² C11D *7/56*

U.S. Cl. 252—99 **8 Claims**

1. A liquid, abrasive, hard surface cleansing composition which leaves little or no abrasive residue on hard surfaces after use, said composition consisting essentially of:

a. from about 0.1% to 7% by weight of a surfactant selected from the group consisting of water soluble alkyl sulfates containing from about 8 to about 18 carbon atoms in the alkyl group;

b. from about 2% to 25% by weight of a particulate expanded perlite abrasive material, substantially all of said material ranging in particle size from 1 micron to 190 microns, said material having an average specific gravity ranging from about 0.2 to 2.2;

c. from about 0.1% to 10% by weight of a bleaching agent which yields hypochlorite species in aqueous solution;

d. from about 1% to 30% by weight of a suspending agent which serves to maintain said expanded perlite abrasive material dispersed throughout said liquid composition wherein said suspending agent is an inorganic colloid-forming clay selected from the group consisting of smectites, attapulgites and mixtures thereof; and

e. the balance of said liquid composition consisting essentially of a filler selected from the group consisting of water and mixtures of water and inorganic salts, the concentration of water ranging from about 10% to 90% by weight of the composition.

4,051,057

SOLUTIONS FOR CLEANING SURFACES OF COPPER AND ITS ALLOYS

Harry Ericson, Grevebergsgatan 13, Vastra Frolunda, Sweden (421 56), and Carl Otto Fredriksson, Bogatan 37 B, Goteborg, Sweden (412 72)

Filed Dec. 8, 1975, Ser. No. 638,697

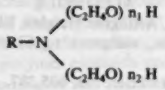
Claims priority, application Sweden, Dec. 13, 1974, 74156480

Int. Cl.² C11D *7/08, 7/18, 7/32*

U.S. Cl. 252—100 **8 Claims**

1. A solution for pickling copper and its alloys which contains 5 - 125 g/l of one or more mineral acids selected from the group consisting of sulphuric acid and phosphoric acid, 2 - 50 g/l hydrogen peroxide, 5 - 100 g/l hydroxy acid selected from the group consisting of citric acid and gluconic acid, and 0.01

- 5 g/l of one or more of the group consisting of benzotriazole and a tertiary amine of the general formula



in which R is an aliphatic carbon chain containing less than 24 carbon atoms and the sum of n_1 and n_2 is less than 30.

4,051,058

STABLE PEROXY-CONTAINING MICROBICIDES

Walter Grosse Bowing; Hinrich Mrozek, both of Dusseldorf; Hans-Joachim Schlussler, Haan; Bernd Tinnefeld, Velbert, and Peter Vogele, Sindelfingen, all of Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

Filed Aug. 3, 1976, Ser. No. 711,205

Claims priority, application Germany, Aug. 16, 1975, 2536618; Apr. 12, 1976, 2616049

Int. Cl.[2] A61K *33/40, 7/135;* **C11D** *7/18, 7/38*

U.S. Cl. 252—186 **9 Claims**

1. A stable peroxy-containing concentrate useful for the production of microbicidal agents consisting essentially of

1. from 0.5% to 20% by weight of an acid selected from the group consisting of peracetic acid, acetic acid, mixtures of peracetic acid and acetic acid, perpropionic acid, propionic acid and mixtures of perpropionic acid and propionic acid,
2. from 25% to 40% by weight of H_2O_2,
3. from 0.25% to 10% by weight of a sequestering compound selected from the group consisting of an organic phosphonic acid capable of sequestering bivalent metal cations and its water-soluble acid salt,
4. from 0 to 5% by weight of an anionic surface-active compound selected from the group consisting of sulfonates and sulfates, and
5. the remainder to 100% by weight, water.

4,051,059

PEROXY-CONTAINING MICROBICIDES STABLE IN STORAGE

Walter Grosse Bowing; Hinrich Mrozek, both of Dusseldorf; Hans-Joachim Schlüssler, Haan; Bernd Tinnefeld, Velbert, and Peter Vögele, Sindelfingen, all of Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

Filed Aug. 3, 1976, Ser. No. 711,206

Claims priority, application Germany, Aug. 16, 1975, 2536617; Apr. 12, 1976, 2616049

Int. Cl.[2] A61K *33/40, 7/135;* **C11D** *7/18, 7/38*

U.S. Cl. 252—186 **7 Claims**

1. A peroxy-containing concentrate, stable in storage, consisting essentially of

1. from 0.5% to 20% by weight of an acid selected from the group consisting of peracetic acid, acetic acid, perpropionic acid, propionic acid, mixtures of peracetic acid and acetic acid, and mixtures of perpropionic acid and propionic acid,
2. from 25% to 40% by weight of H_2O_2,
3. from 0 to 5% by weight of an anionic surface-active compound selected from the group consisting of sulfonates and sulfates, and
4. the remainder to 100% by weight, water.

4,051,060

METHOD FOR THE PREPARATION OF CONCENTRATED NITRATE-DEFICIENT SALT SOLUTIONS

Johannes B. W. Kanij, Zevenaar; Arend J. Noothout, Oosterbeek, and Marie E. A. Hermans, Arnhem, all of Netherlands, assignors to Reactor Centrum Nederland (Stichting), The Hague, Netherlands

Continuation of Ser. No. 358,388, May 8, 1973, abandoned, which is a continuation-in-part of Ser. No. 106,922, Jan. 15, 1971, abandoned. This application Nov. 28, 1975, Ser. No. 636,294

Claims priority, application Netherlands, Jan. 16, 1970, 7000674; Australia, Jan. 15, 1971, 24159/71

Int. Cl.[2] C01B *43/00*

U.S. Cl. 252—301.1 R **14 Claims**

1. A process for the preparation of an aqueous concentrated nitrate-deficient uranyl nitrate solution of a molar nitrate to uranium ratio of about 1.5 or greater, comprising the step of dissolving uranium oxide in a volume of liquid wherein said uranium oxide comprises a mixture having a composition lower than UO_3 and at least equal to or higher than UO_2 and is dissolved in a volume of liquid selected from the group consisting of:

(a) a solution of HNO_3, wherein the amount of said HNO_3 in solution is less than the molar amount of said uranium oxide, so that the uranium concentration in said resulting solution is higher than that of the stoichiometric uranyl nitrate in solution,

(b) an aqueous solution of uranyl nitrate, and

(c) a mixtue of (a) and (b),

such that the resulting solution has a uranium concentration of at least 2 molar, and the ratio of nitrate ions concentration to uranium concentration is between about 1 and 2 moles, thereby obviating the step of concentrating the solution of nitrate-deficient uranyl nitrate solution.

4,051,061

GALLIUM PHOSPHIDE LIGHT EMITTING SEMICONDUCTIVE MATERIALS

Rameshwar Nath Bhargaza, Ossinning, and Gertrude F. Neumark, Hartsdale, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 165,043, July 23, 1971, abandoned. This application Aug. 10, 1973, Ser. No. 387,519

Int. Cl.[2] C09K *11/42*

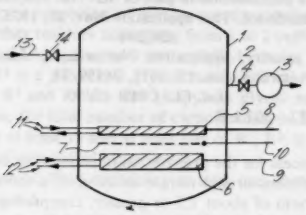
U.S. Cl. 252—301.4 P **1 Claim**

1. Yellow luminescing single crystals of gallium phosphide containing magnesium filled Ga vacancy-O_p nearest-neighbor complexes in a concentration producing under excitation with a light having a wave-length of 4880 A. a spectral output at 105° K. which peaks at about 5800 A., said magnesium being present in a concentration of about 10^{16}-10^{18} per cubic centimeter, and O_p symbolizes an oxygen atom at a phosphorus site in the crystal.

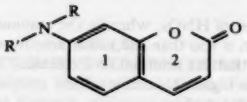
4,051,062
7-AMINO COUMARIN DYES FOR FLASHLAMP-PUMPED DYE LASERS

Peter R. Hammond, Livermore; Erhard J. Schimitschek, San Diego, and John A. Trias, La Mesa, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 3, 1976, Ser. No. 720,175
Int. Cl.[2] H01S *3/20*; F21K *2/00*
U.S. Cl. 252—301.17 4 Claims



1. A laser dye solution comprising a compound of the type



wherein R and R' are the same or different, being selected from the group consisting of hydrogen, methyl, ethyl, and a 3 carbon chain fused to ring 1 to form a heterocyclic ring.

4,051,063
STORAGE OF MATERIAL

Richard Stuart Nelson, Goring-on-Thames; Stanley Frederick Pugh, Abingdon, and Michael John Stapley Smith, Boars Hill, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Nov. 18, 1974, Ser. No. 524,996
Claims priority, application United Kingdom, Nov. 20, 1973, 53893/73
Int. Cl.[2] G21F *9/02*
U.S. Cl. 252—301.1 W 17 Claims

1. A method for the storage of a material within a solid comprising the steps of:

locating a solid in a chamber containing an atmosphere comprising a material to be stored within the solid;

bombarding a surface of the solid with ions of the material of said atmosphere at an energy sufficient such that the material is implanted beneath the surface of the solid and such that erosion of the solid, due to sputtering, does not prevent the implanted material from being retained in said solid, said bombarding forming a concentration of said material within the solid;

depositing on the implanted surface of said solid, by sputtering, additional solid material such that there is a net gain in the thickness of said solid, said sputtering being carried out in said chamber with ions of said atmosphere including ions of said material to be stored; and

bombarding said additional solid material with ions of the material of said atmosphere to implant ions of the material therein such that there is a build up of stored material in the solid.

4,051,064
PROCESS FOR MAKING COLLOIDAL SOLS OF ANTIMONY PENTOXIDE IN POLYHYDROXY ALCOHOLS

Charles E. Crompton, Arlington Heights, Ill., and Abdulla M. Z. Kazi, Euclid, Ohio, assignors to Chemetron Corporation, Chicago, Ill.

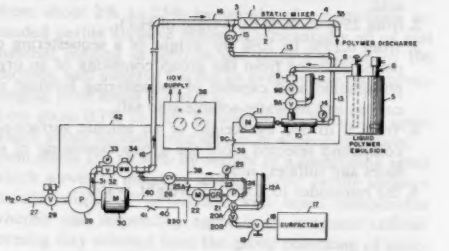
Continuation-in-part of Ser. No. 605,287, Aug. 18, 1975, Pat. No. 3,994,825. This application Aug. 10, 1976, Ser. No. 713,152
The portion of the term of this patent subsequent to Nov. 30, 1993, has been disclaimed.
Int. Cl.[2] B01J *13/00*
U.S. Cl. 252—309 9 Claims

1. A process for making a colloidal dispersion of hydrous antimony pentoxide particles comprising introducing particles of an oxidizable antimony oxide into an aliphatic polyhydroxy alcohol having vicinal hydroxyl groups and contacting said particles with aqueous hydrogen peroxide at a temperature of from about 0° C to about the decomposition temperature of the reaction mixture for a length of time sufficient to convert at least a portion of said particles to colloidal particles of hydrous antimony pentoxide.

4,051,065
APPARATUS FOR DISSOLVING WATER SOLUBLE POLYMERS AND GUMS IN WATER

Gerard J. Venema, Oak Park, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Continuation of Ser. No. 502,722, Sept. 3, 1974, abandoned. This application May 18, 1976, Ser. No. 687,551
Int. Cl.[2] B01F *7/08*
U.S. Cl. 252—359 A 2 Claims



1. A continuous polymer solution preparation system comprising:

a. a static mixer containing stationary helical elements in a tubular chamber having an inlet end and an outlet end,

b. a water supply,

c. a water supply line connecting said water supply of (b) to the inlet end of said mixer of (a),

d. means for continuously forcing water under pressure through said water supply line of (c),

e. a surfactant supply,

f. a surfactant supply line,

g. means for continuously forcing surfactant under pressure from said surfactant supply of (e) through said surfactant supply line of (f),

h. means interconnecting said surfactant line of (f) and said water supply line of (c),

i. a supply of a water-in-oil polymer emulsion of a water soluble vinyl addition polymer in water,

j. a polymer emulsion supply line connected to said supply of (i),

k. means interconnecting said polymer emulsion supply line of (j) and said water line of (c) at a point between the inlet end of said mixer of (a) and the interconnection of said surfactant line of (f) and said water line of (c),

l. means for continuously forcing said polymer emulsion

through said polymer emulsion supply line of (j) under pressure, and

m. a polymer discharge line connected to the outlet end of said mixer of (a), the number of said helical elements and the means for forcing the resulting composition of water, surfactant and polymer emulsion under pressure through said tubular chamber of said static mixer of (a) containing said stationary helical elements being effective to give a Reynolds number of at least 50,000.

4,051,066

CORROSION-INHIBITING RUBBER AND METHODS OF PREPARATION

Boris A. Miksic, Oakdale, and Donovan P. Stern, Staples, both of Minn., assignors to Northern Instruments Corporation, Lino Lakes, Minn.

Filed Jan. 13, 1975, Ser. No. 540,565
Int. Cl.² C23F *11/14, 11/18*
U.S. Cl. 252—389 R **20 Claims**

1. A solid, corrosion-inhibiting elastomer containing a noncellular or intercellular elastomeric matrix, said elastomeric matrix containing a corrosion-inhibiting amount of the corrosion-inhibiting compound cyclohexamethyleneimine dinitrobenzoate distributed through said elastomeric matrix.

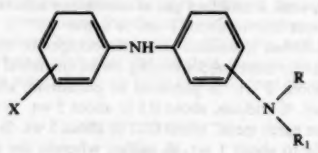
4,051,067

STABILIZATION OF UNSATURATED CARBOXYLIC ACID ESTERS WITH MIXTURES OF POLYALKYLENEAMINES AND ARYLENEDIAMINES

Gene Ray Wilder, Medina, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 436,438, Jan. 25, 1974, abandoned. This application Dec. 29, 1975, Ser. No. 644,613
Int. Cl.² C09K *15/16*
U.S. Cl. 252—401 **14 Claims**

1. An inhibitor composition comprising polyalkyleneamine which is an acyclic aliphatic compound having amino groups attached through alkylene of 1–10 carbon atoms and arylenediamine of the formula



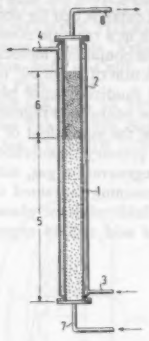
in which X is hydrogen, chloro, trichloromethyl, trifluoromethyl, nitro, lower alkyl, lower alkoxy, or phenoxy, R is hydrogen or alkyl, R_1 is alkyl or phenyl, or R and R_1 together with the nitrogen atom is a heterocyclic radical selected from the group consisting of pyrrolidinyl, 2,5-dimethylpyrrolidinyl, piperidino and hexahydro-1H-azepin-1-yl in which the polyalkyleneamine is 10–90 parts by weight and the arylenediamine is 10–90 parts by weight per 100 parts by weight of the inhibitor composition.

4,051,068

PROCESS FOR REACTIVATING SILVER CATALYSTS USED IN THE MANUFACTURE OF ETHYLENE OXIDE BY DIRECT OXIDATION

Siegfried Rebsdat, Winhoring, Burg; Sigmund Mayer, Burgkirchen-Holzen, and Josef Alfranseder, Hofschallern, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Apr. 27, 1976, Ser. No. 680,778
Claims priority, application Germany, May 2, 1975, 2519599; Mar. 20, 1976, 2611856
Int. Cl.² B01J *23/96*; C07D *301/10, 303/04*
U.S. Cl. 252—412 **9 Claims**



1. Process for reactivating used silver carrier catalysts for the manufacture of ethylene oxide by reacting ethylene with molecular oxygen or air, which comprises adjusting on the catalyst a concentration of cesium, rubidium or of both of from 1 to 1,000 ppm by impregnating the said catalyst with a solution of cesium, rubidium or of both compounds selected from the group consisting of salts and hydroxides in an aliphatic alcohol having from 1 to 6 carbon atoms and containing at most 10% by weight of water and evaporating the alcohol and any water present.

4,051,069

FLUIDIZED CATALYTIC CRACKING REGENERATION PROCESS

Dorrance P. Bunn, Jr.; Dale Williams; Henry B. Jones, all of Houston, and John P. MacLean, Stafford, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed May 7, 1976, Ser. No. 684,505
Int. Cl.² B01J *29/38, 21/20*; C10G *11/18*
U.S. Cl. 252—417 **9 Claims**

1. In a fluidized catalyst cracking process wherein a coke-contaminated, spent cracking catalyst is regenerated, in a single regenerator vessel, by burning coke therefrom at an elevated temperature with a molecular oxygen containing regeneration gas for producing a regenerated catalyst and a flue gas comprising oxides of carbon, the improvement which comprises:

a. flowing hot, spent catalayst substantially vertically downward into the radial center of a first cylindrical regeneration zone having a closed bottom and open top;

b. flowing oxygen containing primary regeneration gas radially into said first regeneration zone under conditions of turbulent flow, for intimately mixing said spent catalyst and primary regeneration gas within said first regeneration zone;

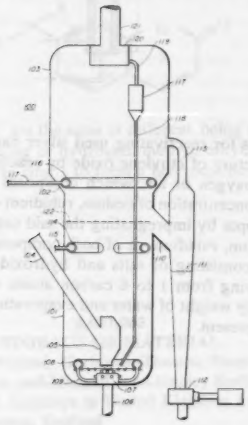
c. flowing said mixture of primary regeneration gas and spent catalyst upwardly from the open top of said first

regeneration zone into the bottom of a second cylindrical regeneration zone, having an open bottom and open top, forming a dense phase bed of catalyst undergoing regeneration fluidized by the flow of regeneration gas therethrough, said fluidized dense phase catalyst bed having a top surface, a temperture in the range of about 1050–1450° F, a catalyst residence timein the range of about 3–20 minutes, a specific coke burning rate in the range of about 0.5 to 1.0 lb coke/hour/lb catalyst, and a regeneration gas superificial vapor velocity in the range of about 2.5 to 6.0 ft/sec;

d, withdrawing, via a regenerated catalyst ductway, hot regenerated catalyst from the upper portion of said fluidized dense phase catalyst bed for contact with a hydrocarbon charge stock in a reaction zone;

e, flowing a trim gas containing molecular oxygen radially in a downwrd direction of about 30° to about 60° from horizontal into said fluidized dense phase catalyst bed at a vertical elevation below said regenerated catalyst duct, at a rate to provide the equivalent of 1–10% of the oxygen supplied in said primary regeneration gas;

f, flowing spent regeneration gas, substantially depleted in oxygen and containing entrained catalyst, from the top surface of said fluidized dense phase catalyst bed through the open top of said second regeneation zone into the



bottom of a frustoconic transition zone, having an open bottom and an open top, wherein said regeneration gas superificial vapor velocity is reduced to about 1.0 to 2.2 ft/sec, such that a major portion of catalyst entrained therein returns to said dense phase bed under the influence of gravity and such that a dilute phase of catalyst entrained in spent regeneration gas is formed;

g. flowing a secondary regeneration gas containing molecular oxygen radially in a direction in the range from about horizontal to about 45° downward from horizontal into said transition zone at a rate to provide an amount of oxygen equivalent to about 1–10% of the oxygen supplied in said primary regeneration gas, for cumbusting substantially all carbon monoxide in said spent regeneration gas to carbon dioxide in said transition zone;

h. flowing said dilute phase of catalyst entrained in spent regeneration gas upwardly through the open top of said transition zone into the bottom of a cylindrical third regeneration zone, having an open bottom and a closed top, wherein said dilute phase is maintained at a temperature in the range of 1150°–1450° F, a pressure in the range of 6–50 psig, a density in the range of 0.1 to 1.0 lb/cu ft., and having a spent regeneration gas superifical vapor velocity in the range of 0.1 to 2.2 ft/sec;

i. flowing said dilute phase from said third regeneration zone into a solid-gas separation zone for separation into a flue gas essentially free of entrained catalyst and separated catalyst;

j. venting said flue gas from said separation zone; and

k. flowing said separated catalyst, via a catalyst dipleg, from said separation zone to said first regeneration zone for admixture with additional spent catalyst and primary regeneration gas.

4,051,070

CATALYST PREPARATION UTILIZING METAL NITRATES AND NITROGEN OXIDE SCAVENGER

Wesley B. Argo, St. Louis; James W. Edwards, Creve Coeur; Albert P. Little, and William M. Lumb, both of Chesterfield, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 2, 1974, Ser. No. 430,017

Int. Cl.[2] B01J *23/26, 37/00*

U.S. Cl. 252—428 **13 Claims**

1. In a method of preparing a catalyst by forming a mixture of a metal nitrate and catalyst support and heating the mixture to decompose the metal nitrate, the improvement of adding a nitrogen oxide scavenger to the mixture, before heating, in an amount sufficient to scavenge the nitrogen oxide produced upon decomposition of the metal nitrate, the said scavenger being selected from the group consisting of lower carboxylic acid amides containing no more than six carbon atoms and urea-formaldehyde resin.

4,051,071

DEHYDROGENATION METHOD AND SULFIDED NONACIDIC MULTIMETALLIC CATALYTIC COMPOSITE FOR USE THEREIN

John C. Hayes, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 518,700, Oct. 29, 1974, Pat. No. 3,939,060, which is a continuation-in-part of Ser. No. 288,864, Sept. 13, 1972, Pat. No. 3,846,282. This application Jan. 19, 1976, Ser. No. 650,574

Int. Cl.[2] B01J *27/04*

U.S. Cl. 252—439 **14 Claims**

1. A sulfided catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % iridium, about 0.01 to about 5 wt. % nickel and about 0.01 to about 1 wt. % sulfur; wherein the platinum or palladium, iridium, and nickel are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum or palladium, iridium and nickel are present therein in the elemental metallic state or in a sulfided state; and wherein the composite is sulfided, prior to contact with the dehydrogenatable hydrocarbon and after substantially all of the platinum or palladium, iridium and nickel contained therein have been reduced to the corresponding elemental metallic state, by treatment with a sulfiding gas at conditions selected to incorporate about 0.01 to about 1 wt. % sulfur.

7. A sulfided nonacidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % iridium, about 0.1 to about 5 wt. % alkali metal or alkaline earth metal, about 0.01 to about 5 wt. % nickel, and about 0.01 to about 1 wt. % sulfur; wherein the platinum or palladium, iridium, alkali metal or alkaline earth metal and nickel are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum or palladium, nicke and iridium are present in the elemental metallic state or in a sulfided state; wherein substantially all of the alkali metal or alkaline earth metal is present in an oxidation state above that of the elemental metal; and wherein the composite is sulfided, prior to contact with any hydrocarbon and after substantially all of the platinum or palladium, iridium and nickel contained therein have been reduced to the corresponding elemental metallic state, by treatment with a sulfiding gas

at conditions selected to incorporate about 0.01 to about 1 wt. % sulfur.

4,051,072

METHOD FOR MAKING PELLET TYPE CATALYST

Raymond E. Bedford, Burton, and Morris Berg, Grand Blanc, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 5, 1976, Ser. No. 673,711
Int. Cl.[2] B01J *21/04, 23/20, 23/24, 23/72, 23/40, 23/74*
U.S. Cl. 252—464 10 Claims

1. In a method for making pellet-type catalysts the improvement comprising the steps of grinding to the desired size refractory ceramic support materials having a high free alkali metal content of at least about 0.15% based on the weight of said support material, forming the resulting support materials into pellets of the desired shape and size, calcining the pellets to obtain the desired surface area and pore structure, soaking the pellets in a dilute inorganic acid solution having a concentration of from about 0.04 to about 0.15 weight % acid or in a solution of the salt of the acid having an equivalent concentration of acid anion, said soaking being continued for a short period of time of at least about one minute such as to avoid removal of any constitutents forming the support crystallites and to enable penetration of the acid anions into said pellets to the depth to which it is desired to impregnate the pellets with catalytically active metallic material, draining said solution from said pellets, and impregnating said pellets with a solution of a salt or acid of the catalytically active material to the depth of acid or acid salt treatment, said catalytically active material being at least one of the metals selected from the Groups V-B, VI-B and VIII of the Periodic Table of Elements, and copper, the use of said high alkali metal content refractory ceramic support material resulting in substantial cost savings in support material and enabling control of the depth of catalyst impregnation and pellet surface area.

4,051,073

PELLET-TYPE OXIDATION CATALYST

Louis Hegedus, St. Clair Shores, and Jack C. Summers, Troy, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 13, 1976, Ser. No. 658,031
Int. Cl.[2] B01J *21/04, 23/42, 23/44*
U.S. Cl. 252—466 PT 5 Claims

1. A noble metal pellet-type oxidation catalyst comprising a porous alumina support member having a surface area of at least 100 $m^2/g.$ up to about 250 $m^2/g.$ and a pore structure characterized by a macropore volume of at least 0.020 $cm^3/g.$ up to about 0.200 $cm^3/g.$ and a macropore radius greater than about 10,000 A, and a catalyst material selected from the group consisting of platinum and platinum/palladium deposited on said support to a depth of at least 90 microns up to about 250 microns, said pore structure serving to increase the diffusivity of the reactants into the interior of the catalyst, the surface area serving to compensate for the otherwise accelerated rate of poisoning caused by the increase in diffusivity, and the depth of deposit being such that the catalyst poisons do not break through the zone of deposit prior to the desired lifetime of the catalyst.

4,051,074

RESISTOR COMPOSITION AND METHOD FOR ITS MANUFACTURE

Eiichi Asada, Tokyo, Japan, assignor to Shoei Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1975, Ser. No. 626,773
Int. Cl.[2] H01B *1/02*
U.S. Cl. 252—503 9 Claims

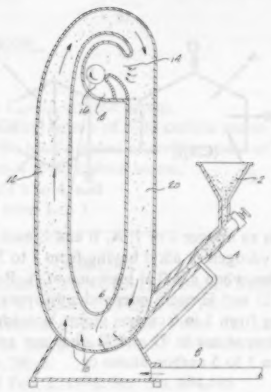
1. A process for varying the resistance value of a resistor composition containing 10–60 parts by weight of a conductive material selected from the group consisting of gold, silver, platinum, rhodium, ruthenium, osmium, iridium, vanadium, tin, tungsten, carbon and alloys, mixtures and oxides thereof, said conductive material having a known specific surface area, 90–40 parts by weight of a glass frit having a known specific surface area, and a vehicle therefor which comprises increasing or decreasing the total surface area of said conductive material and glass frit while maintaining the weight ratio of said conductive material to said glass frit constant without changing the temperature coefficient of resistance of said composition.

4,051,075

COATED PARTICLES AND CONDUCTIVE COMPOSITIONS THEREFROM

Robert Smith-Johannsen, Portola Valley, and Wendell W. Moyer, Jr., Atherton, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 468,668, May 10, 1974, Pat. No. 3,992,558.
This application Feb. 3, 1976, Ser. No. 654,990
Int. Cl.[2] H01B *1/00*
U.S. Cl. 252—511 4 Claims



1. A process for coating discrete electrically conductive particles of less than 20 microns with a high polymer coating comprising:

injecting the polymer and particles into a chamber;

injecting a fluid stream into the chamber under pressure and at an elevated temperature, said fluid propelling the polymer and particles at high velocities along an arcuate path having both a recycle and separation outlet, wherein said polymer and said particles undergo repeated high velocity impacts with each other thereby coating said particles with said polymer and wherein discrete articles of less than approximately 20 microns having the polymer coating thereon are separated out of the chamber, but agglomerated particles of greater than 20 microns are recycled around the arcuate path, said separated particles being free-flowing and non-agglomerative and electrically conductive; and

dispersing the separated conductive particle in a suitable binder to produce a conductive coating.

4,051,076

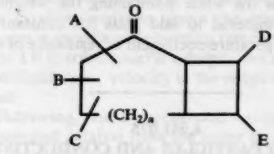
AROMA CHEMICALS

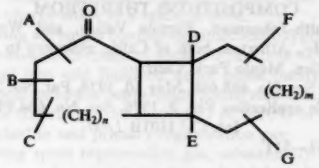
Jordan J. Bloomfield, and Dennis C. Owsley, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 29, 1975, Ser. No. 645,188
Int. Cl.[2] C11B *9/00*; C07C *13/28, 45/00, 49/00*
U.S. Cl. 252—522 30 Claims

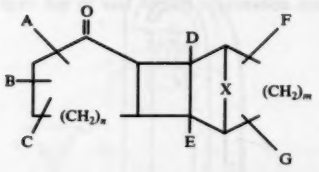
1. A fragrance composition having incorporated therein an

odoriferous amount of a compound represented by the structural formulae:





or



wherein *n* is an integer 0 or 1; A, B and C each independently represent hydrogen or alkyl having from 1 to 3 carbon atoms, provided that when *n* is 0 at least one of A, B or C cannot be hydrogen; D and E each independently represent hydrogen, alkyl having from 1 to 6 carbon atoms, provided that the sum of the carbon atoms in D and E does not exceed 6, alkoxy having from 1 to 5 carbon atoms or

wherein R represents alkyl having from 1 to 6 carbon atoms or aryl, provided that if either D or E is alkoxy or

then the other substituent D or E must be hydrogen; *m* is an integer 1 through 8; F and G represent hydrogen or alkyl having from 1 to 3 carbon atoms; X represents

wherein *p* is an integer 0 through 2 and I and J each independently represent hydrogen or methyl, provided that if *p* is 0 then *m* must be greater than 2; provided that the sum of the carbon and oxygen atoms in the compound is no greater than 23 and at least one carrier commonly used in fragrance compositions.

4,051,077

NON-FILMING DUAL ADDITIVE DEVELOPER

Donald J. Fisher, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 445,389, Feb. 25, 1974, Pat. No. 3,900,588. This application Jan. 27, 1975, Ser. No. 544,095

Int. Cl.[2] G03G *9/00*

U.S. Cl. 252—62.1 P **13 Claims**

1. An electrostatographic developing composition comprising particles; said particles including (1) finely divided electroscopic toner material, (2) a minor portion, based upon the weight of said toner material of a stable, tough, substantially smearless, polymeric additive having an average particle size less than about the average particle size of said finely divided toner material, and (3) a minor portion, based on the weight of said toner material, of a finely divided nonsmearable abrasive material of a hardness greater than said polymeric additive and said toner material.

4,051,078

CHLORINATED ELASTOMER COMPOSITIONS

Hirosi Kato, Nishinomiya, and Hideo Fujita, Takarazuka, both of Japan, assignors to Dainichi-Nippon Cables, Ltd., Amagasaki, Japan

Filed Oct. 14, 1975, Ser. No. 622,449

Claims priority, application Japan, Apr. 15, 1975, 50-46260; July 31, 1975, 50-93896

Int. Cl.[2] C08F *8/26;* **C08G** *65/24*

U.S. Cl. 260—2 A **7 Claims**

1. A chlorinated elastomer composition comprising

a. a chlorinated elastomer selected from the group consisting of polychloroprene, chlorinated polyethylene and polyepichlorohydrin,

b. 3 to 30 parts of at least one metal oxide of Groups II, IV, V, VI, and VIII of the Periodic Table, wherein the metal has an oxidation state of 2 to 5 valences as a curing agent, and

c. 0.1 to 10 parts of at least one accelerator having the general formula:

$$A—(S)_n—A'$$

wherein S is sulfur atom, A and A' are polyhydroxy aryl groups having 6 to 18 ring carbon atoms and n is zero or an integer of 1 to 4, said parts of (b) and (c) being parts by weight per 100 parts of (a).

4,051,079

REGENERATION OF ACIDIC CATION EXCHANGE RESIN USING ACIDIFIED PHENOL-WATER MIXTURE

Earl George Melby, Somerville, N.J., assignor to Union Carbide Corporation, New York, N.Y.

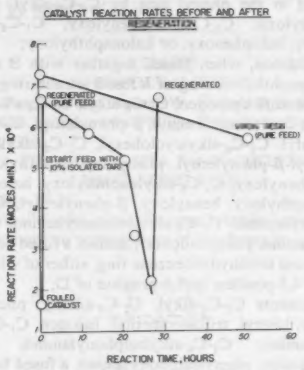
Filed June 22, 1976, Ser. No. 698,764

Int. Cl.[2] B01D *15/06;* **B01J** *1/09*

U.S. Cl. 260—2.2 R **8 Claims**

1. Process for regenerating sulfonated acidic cation exchange resin that has been deactivated with phenol-derived

organic tars or by contamination with metallic ions, or both, which process comprises passing a phenol-water mixture con-



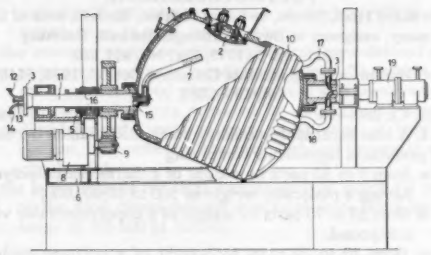
taining an acid having a pKa of less than about 3 through said resin, wherein the major component of said mixture is phenol.

4,051,080

METHOD FOR RECLAIMING CURED RUBBER SCRAPS

Temistocle Boccoli, Broni, Pavia, Italy, assignor to Piovanelli Macchinari e Impianti S.p.A., S. Ilario D'Enza, Italy

Filed May 6, 1975, Ser. No. 575,064
Claims priority, application Italy, May 14, 1974, 22685/74
Int. Cl.² C08J *11/04*
U.S. Cl. 260—2.3 **6 Claims**



1. A method of reclaiming rubber, consisting essentially of the combination of steps of heating scraps of cured rubber which have been freed of non-rubbery components, the compositions of the scraps being identical or compatible and the size of the scraps being substantially uniform, at a temperature below the curing temperature of said scraps in an autoclave which is heated externally while subjecting said scraps to agitation to effect even mixing and constant movement of said scraps, said heating and agitating of the scraps being undertaken in the presence of water in the form of steam equal to a percentage by weight of the scraps which percentage may vary from 5 to 10% wherein the exact amount of water relative to said scraps is controlled to determine the extent to which the scraps become plastic and in the presence of air, the volume of which is sufficient to effect a pressure within the autoclave of between 10 and 30 atmospheres, for a period of time sufficient to cause the contents of the autoclave to reach a temperature of about 110° C and continuing said treatment for a period of time of at least 15 minutes which is a period of time sufficient to plasticize said scraps.

4,051,081

PROCESS FOR MAKING HYDROPHILIC POLYURETHANE FOAMS

Gert Jabs, Schildgen, and Gunther Loew, Leichlingen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 449,296, March 8, 1974, abandoned. This application July 15, 1976, Ser. No. 705,648
Claims priority, application Germany, Mar. 14, 1973, 2312678
The portion of the term of this patent subsequent to Mar. 25, 1992, has been disclaimed.
Int. Cl.² C08G *18/14*
U.S. Cl. 260—2.5 AD **6 Claims**

1. In a process for producing a hydrophilic polyurethane foam which comprises reacting an organic polyisocyanate, an organic compound which contains at least two active hydrogen atoms in a mixture containing a blowing agent, the improved process of producing a hydrophilic polyurethane which comprises including in the reaction mixture from about 2 to about 10% by weight based on the weight of said organic compound of an alkyl aryl sulphonic acid which is soluble in said organic compound wherein said alkyl aryl sulphonic acid has the formula

$$R_n—Ar—[—SO_3H]_m$$

wherein

Ar represents a C_6–C_{14} arylene group,

R represents an alkyl group of 2–20 carbon atoms with the proviso that the total number of carbon atoms of all alkyl groups is from 4 to 40 carbon atoms,

n in an integer of 1 to 4, and

m is an integer from 1 to 3

4,051,082

CARBODIIMIDE-ISOCYANURATE FOAMS MODIFIED WITH ETHOXYLATED POLYOLS

Moses Cenker, Trenton, Mich., and Peter Tai-Yuen Kan, Plymouth, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Feb. 2, 1976, Ser. No. 654,445
Int. Cl.² C08G *18/50*
U.S. Cl. 260—2.5 AR **10 Claims**

1. A cellular foam characterized by carbodiimide, isocyanurate and urethane linkages prepared by catalytically condensing an organic polyisocyanate in the presence of (a) a carbodiimide-promoting catalyst; (b) a trimerization catalyst; (c) a urethane catalyst, and (d) from 10 parts to 40 parts by weight per 100 parts by weight of polyisocyanate of a polyol mixture comprising (1) from 5 parts to 30 parts of a polyoxyethylated polyhydric alcohol and (2) from 5 parts to 25 parts of an ethoxylated acid of phosphorus, said acid having a P_2O_5 equivalency of from about 72% to about 95% by weight.

4,051,083

ELASTOMER BLENDS FOR TIRE COMPONENTS

Neil F. Newman, Edison, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 444,313, Feb. 21, 1974, abandoned. This application Aug. 1, 1975, Ser. No. 601,076
Int. Cl.² C08L *7/00, 9/06*
U.S. Cl. 260—5 **9 Claims**

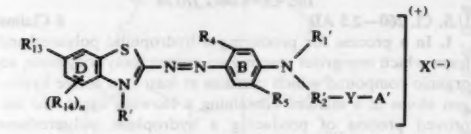
1. A method for improving the weather resistance, flex and ozone resistance of tire flexing components prepared from blends of highly unsaturated rubbers, said blends comprising 25 to 75% by weight of natural rubber, the balance of said blends being styrene-butadiene rubber or polybutadiene rubber, which comprises incorporating into the tire flexing composition about 25 to about 40 parts per hundred based on the highly unsaturated rubber blend of a chlorinated EPDM containing 0.1 to 0.9 weight % chlorine.

4,051,084
CATIONIC DYESTUFFS

Hans-Peter Kuhlthau, Leverkusen, and Hermann Beecken, Schildgen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

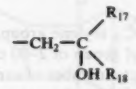
Filed Jan. 9, 1975, Ser. No. 539,778
Claims priority, application Germany, Jan. 11, 1974, 2401246
Int. Cl.[2] C09B *29/36, 29/22;* D06P *3/76*
U.S. Cl. 260—158 **7 Claims**

1. Dyestuff of the formula:



wherein

R′ represents C_1-C_6-alkyl, halo-C_1-C_6-alkyl, hydroxy-C_1-C_6-alkyl, cyano-C_1-C_6-alkyl, acetoxy-C_1-C_6-alkyl, C_1-C_4-alkoxycarbonyl-C_1-C_6-alkyl, carbonyl-C_1-C_6-alkyl, aminocarbonyl-C_1-C_6-alkyl, C_2-C_7-alkenyl, benzyl, phenylethyl, or



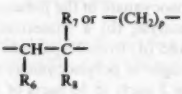
wherein

R_{17} denotes hydrogen or methyl and

R_{18} denotes methyl, ethyl, chloromethyl, methoxymethyl, ethoxymethyl, propoxymethyl, butoxymethyl, allyloxymethyl, phenoxymethyl, or phenyl;

R_1′ represents C_1-C_6-alkyl, C_2-C_7-alkenyl, cyclopentyl, cyclohexyl, benzyl, β-phenylethyl, C_1-C_6-alkylcyclopentyl, C_1-C_6-alkylcyclohexyl, C_1-C_6-alkylbenzyl, C_1-C_6-alkyl-β-phenylethyl or C_1-C_6-alkyl substituted by halogen, hydroxyl, C_1-C_4-alkoxy, phenoxy, cyano, acetoxy, hydroxycarbonyl, C_1-C_4-alkoxycarbonyl, C_1-C_4-alkoxycarbonyloxy, aminocarbonyl, C_1-C_4-alkylsulphonylamino, or C_1-C_4-alkylsulphonyl-C_1-C_4-alkylamino;

R_2 represents



R_6 denotes hydrogen, methyl, ethyl, methoxymethyl, ethoxymethyl, propoxymethyl, butoxymethyl, allyloxymethyl, phenyl, or phenoxymethyl;

R_7 denotes hydrogen, methyl, ethyl, butoxymethyl, methoxymethyl, ethoxymethyl, propoxymethyl, allyloxymethyl, phenyl, phenoxymethyl, or —Y—A′;

R_8 denotes hydrogen or methyl;

p denotes the numbers 1 - 6;

Y represents oxygen or sulphur;

R_4 represents hydrogen, halogen, C_1-C_6-alkyl, halo-C_1-C_6-alkyl, C_1-C_4-alkoxy, C_1-C_4-alkylcarbonylamino, C_1-C_4-alkylsulphonylamino, phenylcarbonylamino, phenylsulphonylamino, C_1-C_4-alkylcarbonyloxy, phenylcarbonyloxy, benzyloxy, β-phenylethyloxy, or either of the last two mentioned radicals substituted in the phenyl ring by C_1-C_6-alkyl, phenyloxy, naphthyloxy, C_1-C_6-alkylphenyloxy, C_1-C_6-alkylnaphthyloxy, halophenoxy, or halonaphthyloxy, or in addition, when joined together with B represents a fused naphthalene ring or a fused tetralin ring;

R_5 represents hydrogen, C_1-C_6-alkyl, C_1-C_4-alkoxy, C_1-C_4-alkylcarbonylamino or C_1-C_4-alkylsulphonylamino, phenylcarbonylamino, phenylsulphonylamino, C_1-C_4-alkylcarbonyloxy, phenylcarbonyloxy, benzyloxy, β-phenylethyloxy, or either of the last two mentioned radicals substituted in the phenyl ring by C_1-C_6-alkyl, phenyloxy, naphthyloxy, C_1-C_6-alkylphenyloxy, C_1-C_6-alkylnaphthyloxy, halophenoxy, or halonaphthyloxy; or in addition, when joined together with B represent a fused naphthalene ring or a fused tetralin ring;

R_{13}′ represents hydrogen, C_1-C_6-alkyl, C_1-C_4-alkoxy, cyclopentyl, cyclohexyl, benzyl, β-phenylethyl, C_1-C_6-alkylcyclopentyl, C_1-C_6-alkylcyclohexyl, C_1-C_6-alkylbenzyl, C_1-C_6-alkyl-β-phenylethyl, phenyloxy, naphthyloxy, C_1-C_6-alkylphenyloxy, C_1-C_6-alkylnaphthyloxy, halophenyloxy, halonapthyloxy, benzyloxy, β-phenylethyl, C_1-C_4-alkylcarbonylamino, C_1-C_4-alkylsulphonylamino, phenylcarbonylamino, phenylsulphonylamino, a fused benzene ring, or a fused tetrahydrobenzene ring, either of which is fused in the 4,5-position or 5,6-position of D;

R_{14} represents C_1-C_6-alkyl, C_1-C_4-alkoxy, phenoxy, benzyloxy, benzyl, trifluoromethyl, halogen, C_1-C_4-alkylcarbonylamino, C_1-C_4-alkylsulphonylamino, phenylcarbonylamino, phenylsulphonylamino, a fused benzene ring or a fused tetrahydrobenzene ring either of which is fused in the 6,7-position of D;

A′ is a member of a group consisting of cyclohexyl, naphthyl, phenyl, or phenyl substituted by chloro, methyl, ethyl, isopropyl, sec. butyl, tert. butyl, tetramethylbutyl, nonyl, dodecyl, phenyl, benzyl, cyclohexyl, phenyl-isopropyl, methoxy, ethoxy, isopropoxy, phenylsulfonyl or methylthio;

n represents the numbers 0, 1, 2, or 3; and

$X^{(-)}$ represents an anion.

4,051,085
HARDENABLE MOULDING COMPOSITIONS CONTAINING A THERMOPLASTIC POLYMER A COPOLYMERIZABLE VINYL COMPOUND AND A POLYESTERURETHANE

Bernhard Hess, Moers, and Karl Raichle, Krefeld, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Oct. 9, 1975, Ser. No. 621,220
Claims priority, application Germany, Oct. 15, 1974, 2448929
Int. Cl.[2] C08L *1/14*
U.S. Cl. 260—16 **6 Claims**

1. A heat hardenable moulding composition which is a blend of preformed ingredients comprising

a. from 3 to 30 parts by weight of a thermoplastic polymer having a molecular weight of 500 to 10,000,000,

b. from 20 to 70 parts by weight of a copolymerizable vinyl compound,

c. from 20 to 70 parts by weight of a polyesterurethane having α, β-ethylenically unsaturated dicarboxylic acid residues and a urethane group equivalent of at least 0.05 equivalents per 100 g. of polyesterurethane and

d. a viscosity-increasing amount of a member selected from the group consisting of oxides and hydroxides of the metals of Group IIa of the Periodic Table.

4,051,086
ABSORPTION RATE OF ABSORBENT POLYMERS BY TREATING WITH GLYOXAL

Albert Richard Reid, Hockessin, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Mar. 25, 1976, Ser. No. 670,484
Int. Cl.[2] C08L *1/02*
U.S. Cl. 260—17.4 GC **11 Claims**

1. A method of increasing the water or saline solution absorption rate of a water-insoluble, crosslinked polymer selected from the class consisting of acrylamide homopolymer, copolymers of acrylamide and a second vinyl monomer copolymerizable therewith, homopolymers of sodium acrylate, homopolymers of sodium methacrylate, and polysaccharides

grafted with copolymers of acrylamide and a second vinyl monomer copolymerizable therewith, which method comprises applying to the surface of particles of said polymer about 0.2 to 5% by weight of glyoxal.

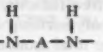
4,051,087

COPOLYAMIDE

Lacey E. Scoggins, and Robert W. Campbell, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

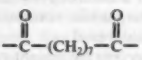
Filed May 20, 1976, Ser. No. 687,973
Int. Cl.² C08G 69/26
U.S. Cl. 260—18 N **24 Claims**

1. A normally solid, moldable copolyamide having: diamine-derived primary structural units of the formula

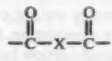


wherein each A is individually selected from the group consisting of 5-methylnonamethylene, 2,4-dimethyloctamethylene, 2,4,6-trimethylheptamethylene, and 4-isopropylheptamethylene;

first diacid-derived primary structural units of the formula



and second diacid-derived primary structural units of the formula



wherein X is divalent aliphatic hydrocarbon radical containing from 14 to 46 carbon atoms;

the nitrogen atoms provided by said diamine-derived primary structural units constituting at least 70 percent, by number, of the total nitrogen atoms in said copolyamide; the carbonyl groups provided by said first and second diacid-derived structural units constituting at least 70 percent, by number, of the total carbonyl groups in said copolyamide;

the molar ratio of the total diamine-derived structural units to the total diacid-derived structural units being in the range of 105:100 to 100:105.

4,051,088

LIQUID THERMOSETTING COATING COMPOSITIONS

David Vincent Gibson, North Bayswater, Australia, assignor to Dulux Australia Ltd., Australia

Filed Aug. 11, 1975, Ser. No. 603,284
Claims priority, application Australia, Aug. 26, 1974, 8662/74
Int. Cl.² C09D 3/52, 3/56, 3/66
U.S. Cl. 260—20 **5 Claims**

1. A liquid thermosetting coating composition having a weight solids content of 70% minimum characterised in that the film-forming component thereof is a blend of the following constituents;

1. from 60–95% by weight of an acid half-ester of a carboxylic acid anhydride and a polyol, the polyol being a diester of a diepoxide, an autoxidative monocarboxylic fatty acid and a monocarboxylic hydroxy-acid, further characterised in that the diepoxide has an epoxide equivalent of 300 maximum, the acid half-ester is epoxide-free and comprises on average 1.5–2.5 hydroxy groups, 1–2 carboxyl groups and 1–2 autoxidative residues of monocarboxyolic fatty acids per molecule; and
2. from 5–40% by weight of a crosslinking agent reactable with hydroxyl groups of the acid half-ester to form a crosslinked molecular net work.

4,051,089

WATER REDUCIBLE SHORT OIL ALKYD RESINS AND PROCESS OF MAKING SAME

Michael A. Tobias, Somerville, and Carlos J. Martinez, Edison, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 21, 1975, Ser. No. 570,340
Int. Cl.² C09D 3/64, 3/66
U.S. Cl. 260—22 R **12 Claims**

1. A water reducible short oil alkyd resin consisting essentially of the reaction product of from about 10–15 wt. % based on the total weight of the reactants of a polyethylene glycol having a molecular weight between about 200–2000; from about 20–25 wt. % based on the total weight of the reactants of a triglyceride having from about 30–60 carbon atoms; from about 18–23 wt. % based on the total weight of the reactants of a polyol having from about 2 to about 6 hydroxy groups; and from about 43–48 wt. % based on the total weight of the reactants of an aromatic dicarboxylic acid or anhydride having from about 8–12 carbon atoms; said resin having an alcoholic acid number between about 45 and about 65.

4,051,090

ADHESIVE BONDING

Carl Horowitz; Michael Dichter, both of Brooklyn, N.Y., and Navinchandra Bhogilal Shah, Jersey City, N.J., assignors to Polygulf Associates, New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,515
Int. Cl.² C08L 61/06
U.S. Cl. 260—23.7 M **3 Claims**

1. An adhesive, for bonding a first elastomeric substrate to a second elastomeric substrate, comprising:

i. elastomer
ii. prepolymer
iii. graft initiator, having the following constituents in parts by weight:

Styrene butadiene rubber	70.00
Butadiene propolymer having pendant vinyl groups	3.00
Carbon black	4.50
Benzene	22.50
Sulfur	0.25
Benzothiazyldisulfide	0.15
Zinc oxide	0.50
Stearic acid	0.10
Antioxidant	0.15
Accelerator	3.00
Toluene	40.85
Divinyl benzene	2.00
Cumyl peroxide	0.10
Silver perchlorate	0.40
Methyl ethyl ketone	2.50

4,051,091

WATER-DISPERSION VARNISH FOR ELECTRODEPOSITION AND PROCESS FOR MAKING SAID WATER DISPERSION VARNISH

Kyoichi Shibayama; Hiroshi Ono; Eiki Jidai, and Akira Fujii, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 19, 1974, Ser. No. 525,065
Int. Cl.² C08J 3/10; C08L 79/08; C25D 13/06, 13/20
U.S. Cl. 260—29.2 TN **10 Claims**

1. A process for preparing a water-dispersion varnish suitable for electrodeposition which comprises reacting the reaction product of

A. a polyesterimide having a carboxyl group in its chain or at the terminus of the chain and having an ester

group and an imide group in its repeating unit or a polyesteramideimide having a carboxyl group in its chain or at the terminus of the chain and having an ester group, an imide group and an amide group in its repeating unit and

B. an organic compound having at least two hydroxyl groups with

C. a polybasic acid or its anhydride in the presence or absence of a solvent yielding a modified polyesterimide or polyesteramideimide having a molecular weight of from 5,000–100,000 and an acid value of 10–100;

dissolving said modified polyesterimide or polyesteramideimide in an organic solvent;

dispersing said modified polyesterimide or polyesteramideimide solution in an aqueous solution containing a surfactant and a volatile base; and forming a water dispersion of said modified polyesterimide or polyester amideimide by passing or bubbling an inert gas through the dispersion of said modified polyesterimide or polyester amideimide solution and said aqueous solution to remove all or part of said solvent and volatile base.

7. A water-dispersion varnish which is suitable for use in electrodeposition which is formed by reacting

the reaction product of

A. a polyesterimide having a carboxyl group in its chain or at the terminus of the chain and having an ester group and an imide group in its repeating unit or a polyesteramideimide having a carboxyl group in its chain or at the terminus of the chain and having an ester goup, an imide group and an amide group in its repeating unit, and

B. an organic compound having at least two hydroxyl groups with

C. a polybasic acid or its anhydride in the presence or absence of a solvent yielding a modified polyesterimide or polyesteramideimide having a molecular weight of from 5,000–100,000 and an acid value of 10–100;

dissolving said modified polyesterimide or polyesteramideimide in an organic solvent;

dispersing said modified polyesterimide or polyesteramideimide solution in an aqueous solution containing a surfactant and a volatile base; and

forming a water dispersion of said modified polyesterimide or polyester amideimide by passing or bubbling an inert gas through the dispersion of said modified polyesterimide or polyesteramideimide solution and said aqueous solution to remove at least part of said solvent and volatile base.

4,051,092

FOUNDRY CORE COMPOSITION OF AGGREGATE AND A BINDER THEREFOR

Melville J. Holik, Franklin Park, and John F. Kraemer, Chicago, both of Ill., assignors to International Minerals & Chemical Corporation, Libertyville, Ill.

Continuation-in-part of Ser. No. 631,583, Nov. 15, 1975, abandoned. This application Oct. 26, 1976, Ser. No. 733,721

Int. Cl.[2] C08L *61/10*

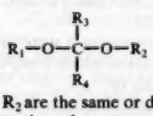
U.S. Cl. 260—29.3 **8 Claims**

1. A foundry core mix adapted to being cured by a catalyst comprising a foundry aggregate and about 1% to 5% by weight of the aggregate of a binder comprising in admixture:

a. a curable resin base of the group consisting of epoxy resins, polyester resins, and aqueous phenol-formaldehyde resins,

b. a reactive liquid polyisocyanate in the amount of 80% to 125% by weight of the resin base, and;

c. a solvent of the formula



in which R_1 and R_2 are the same or different hydrocarbon radicals of three to six carbon atoms and R_3 and R_4 are the same or different hydrogen, methyl, ethyl or phenyl radicals.

4,051,093

MANUFACTURE OF SHEAR-RESISTANT AQUEOUS COPOLYMER EMULSIONS

Kurt Wendel, Ludwigshafen; Fritz Reichel, Eppelheim, and Christof Taubitz, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Oct. 29, 1975, Ser. No. 626,749

Claims priority, application Germany, Nov. 6, 1974, 2452585

Int. Cl.[2] C08L *25/04, 33/02*

U.S. Cl. 260—29.6 TA **3 Claims**

1. In a process for the manufacture of shear-resistant, aqueous copolymer emulsions by copolymerizing the monomers in an aqueous emulsion containing conventional polymerization initiators which form free radicals, the improvement which comprises initially copolymerizing in a reaction vessel (the amounts being based on total monomers)

A. from 0.5 to 15 percent by weight of monoolefinic monomers containing a functional group selected from the groups consisting of the carboxyl group, the sulfonic acid group and the phosphate group, and

B. from 5 to 30 percent by weight of monoolefinic monomers containing a functional group selected from the group consisting of a tertiary amino group, a quaternary amino group and a heterocyclic group containing nitrogen and thereafter, while continuing the copolymerization, adding to said vessel

C. from 0 to 94.5 percent by weight of a monomer from the group consisting of styrene and acrylonitrile and

D. from 0 to 94.5 percent by weight of acrylic or methacrylic acid esters of alkanols of 1 to 8 carbon atoms, as well as

E. from 0 to 30 percent by weight of further olefinic monomers and thereafter completing the polymerization, the pH during the polymerization being less than 7 and the amount of monomers (C) and (D) together being at least 25 percent by weight.

4,051,094

ELECTRICAL CONDUCTIVE LACQUER

Franz Gottfried Reuter, and Tankred Menzel, both of Lemforde, Germany, assignors to Reuter Maschinen et al, Lemforde, Germany

Continuation of Ser. No. 504,192, Sept. 9, 1974, which is a division of Ser. No. 292,321, Sept. 26, 1972, abandoned. This application Oct. 9, 1975, Ser. No. 621,767

Claims priority, application Germany, Sept. 27, 1971, 2148191; Oct. 16, 1971, 2151626; July 12, 1972, 2234216

Int. Cl.[2] C08L *31/04*

U.S. Cl. 260—29.6 M **2 Claims**

1. An electrically conductive lacquer consisting essentially of silver-plated copper particles, acetylene soot particles, and a binder, the binder being an aqueous dispersion of a copolymer of butyl acrylate, vinyl acetate, and acrylic acid in an aqueous silicate solution.

4,051,095

HYDROLYZED POLYURETHANE PLASTICIZER

Yale Karmell, Chicago, Ill., assignor to Samuel Bingham Co., Franklin Park, Ill.

Filed Jan. 26, 1976, Ser. No. 652,418

Int. Cl.[2] C08K *5/11, 5/12, 5/16*

U.S. Cl. 260—31.8 DR **4 Claims**

1. A method for modifying the hardness of an acrylonitrile-butadiene rubber which comprises mixing with the rubber and curing agents a proportion of plasticizer sufficient to modify the hardness of the cured rubber to the desired degree and curing the rubber-plasticizer mix, said plasticizer comprising a mixture, by weight of from 25% to 75% of an ester plasticizer

and from 75% to 25% of a hydrolyzed polyester-based polyurethane elastomer produced by autoclaving said elastomer with steam at an elevated temperature and pressure until it becomes liquid, said ester plasticizer having the general miscibility characteristics, with respect to said rubber and said hydrolyzed elastomer, of dioctyl phthalate, dibutyl phthalate, dioctyl adipate, and dioctyl sebacate.

4,051,096

RESIN COMPOSITION

Toshinori Koseki; Kunio Maeda; Michihiro Aboshi, and Haruo Kinoshita, all of Kawasaki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 436,631, Jan. 25, 1974, abandoned. This application June 15, 1976, Ser. No. 696,395

Int. Cl.[2] C08K *5/01, 5/12*

U.S. Cl. 260—31.8 M **25 Claims**

1. A stable resin composition which comprises 0.1 to 25 percent by weight of an oil retainer, 99.8 to 50 percent by weight of a base resin and 0.1 to 25 percent by weight of an oil, with the weight ratio of oil to oil retainer being from 2 to 1 to 15 to 1 the said oil being absorbed and remaining absorbed by the oil retainer;

said oil retainer being a thermoplastic resin which has a lower flowing temperature than the base resin, and at normal room temperatures remains undissolved in the oil and absorbs not more than 0.03 times its own weight of oil, and which, at a temperature 10° C higher than the flowing temperature of the base resin, dissolves in the oil or absorbs not less than 0.3 times its own weight of oil;

said base resin being a thermoplastic resin which remains undissolved in the oil and absorbs not more than 0.03 times its own weight of oil, and, at a temperature 10° C higher than the flowing temperature of the base resin, it absorbs not more than one half of the weight of the oil absorbed by the oil retainer and is different from the oil retainer;

and said oil being a lubricating oil which is liquid at normal room temperatures or which, though solid at normal room temperatures, becomes fluidized at a temperature lower than the flowing temperature of the base resin.

4,051,097

CARBON METALLIC FRICTION COMPOSITION

Francis William Aldrich, Troy, N.Y., assignor to The Bendix Corporation, South Bend, Ind.

Continuation of Ser. No. 322,820, Jan. 11, 1973, abandoned, which is a continuation-in-part of Ser. No. 222,342, Jan. 31, 1972, abandoned. This application Apr. 12, 1976, Ser. No. 676,076

Int. Cl.[2] C08K *3/04*

U.S. Cl. 260—38 **4 Claims**

1. A composition for an automobile brake lining having a substantially uniform coefficient of friction upon frictional engagement with another member up to 740° F., said composition consisting of metal or metal oxide particles from 15–55 volume percent of the total composition, non-graphitic amorphous carbon particles from 10–75 volume percent of the total composition, an elastomer from 0–10 volume percent of the total composition and an organic resin from 15–35 volume percent of the total composition, said organic resin holding the metal or metal oxides, the non-graphic amorphous carbon particles and the elastomer together, said elastomer attenuating noise created by frictional engagement of the brake lining, said amorphous carbon and metal or metal oxide together forming the friction producing material to create said uniform coefficient of friction.

4,051,098

METHOD OF PREPARING SHAPED ACTIVE CARBON

Takeshi Takemura; Yoshihisa Katoh, both of Hamamatsu; Shigeyuki Kurita, Fukuroi; Susumu Sasaki, Fujieda; Kyohei Funabiki, Fujieda, and Keizo Hatano, Fujieda, all of Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo and Daiichi Tanso Kogyo KK, Fukuroi, both of Japan

Continuation-in-part of Ser. No. 491,188, July 24, 1974, abandoned, which is a continuation of Ser. No. 335,608, Feb. 26, 1973, abandoned, which is a continuation-in-part of Ser. No. 129,137, March 29, 1971, abandoned. This application July 30, 1976, Ser. No. 709,985

Claims priority, application Japan, Apr. 2, 1970, 45-27632

Int. Cl.[2] C08K *3/04*

U.S. Cl. 260—38 **10 Claims**

1. A composition comprising active carbon particles and as a binder therefor a cured resin selected from the group consisting of a one-step phenolic resin and a furfural-modified phenolic resin wherein said resin is characterized by being soluble in water at 25° C prior to curing and is combined with said active carbon in a weight ratio from 1 part of said binder to 10 parts of said active carbon to 1 part of said binder to 2 parts of said active carbon.

4,051,099

PROCESS FOR THE DYEING OF THERMOPLASTICS IN THE MELT

Jost von der Crone, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

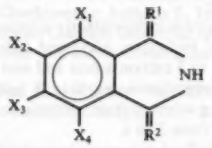
Filed Mar. 30, 1976, Ser. No. 671,804

Claims priority, application Switzerland, Apr. 11, 1975, 4648/75

Int. Cl.[2] C08K *5/24*

U.S. Cl. 260—40 P **9 Claims**

1. Process for the dyeing of thermoplastics in the melt, which process comprises the use of dyestuffs of the formula



wherein $X_1 - X_4$ represents H-atoms or halogen atoms, or one or two of the radicals $X_1 - X_4$ represent alkyl, alkoxy, phenyl or phenoxy groups, and those remaining represent H-atoms, R^1 and R^2 represent radicals of methylene-active compounds, or radicals of the formula $=N—A$ wherein A stands for the radical of an aliphatic, cycloaliphatic, araliphatic, aromatic or heterocyclic amine or hydrazine, whereby, provided that R^1 and R^2 represent radicals of the formula $=N—A$, one A represents a heterocyclic radical containing N-atoms, optionally together with O- or S-atoms.

4,051,100

FLUOROELASTOMER-BASED COMPOSITE MATERIAL

Roger O. Bjerk, Edelstein; William D. Brandon; Frederick S. Engelking, both of Peoria, and John Parker Jero, Washington, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 366,967, June 4, 1973, Pat. No. 3,898,361. This application July 14, 1975, Ser. No. 595,822

The portion of the term of this patent subsequent to Aug. 5, 1992, has been disclaimed.

Int. Cl.[2] C08K *3/04, 7/14*

U.S. Cl. 260—42.18 **3 Claims**

1. As an article of manufacture a friction material formed of an elastomeric matrix comprising from about 20 to about 50% by weight of an elastomeric copolymer of hexafluoropropylene and vinylidene fluoride, and from about 12 to about 40%

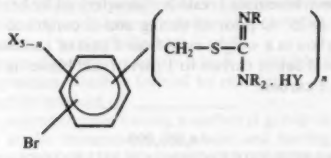
by weight of carbon black; and said friction material further containing from about 20 to about 60% by weight of glassy or ceramic asperite particles of from about 0.0001 to about 0.005 inch in effective diameter intermixed with and dispersed throughout said friction material in mechanically held nonbonded relation to provide a friction surface of said article of manufacture including the said matrix and said asperite particles.

4,051,101
HALOGENATED ISOTHIURONIUM SALTS AS FLAME RETARDANTS

Michael W. Lindvay, Ann Arbor, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed July 12, 1976, Ser. No. 704,335
Int. Cl.[2] C08K 5/29; C07C 123/00
U.S. Cl. 260—45.85 R 22 Claims

1. Bromophenyl isothiuronium salts of the formula:



wherein:

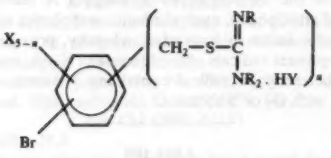
each X substituent is independently selected from a group consisting of hydrogen, chlorine, bromine, alkyl, and haloalkyl, said alkyl containing 1 to 6 carbon atoms and said haloalkyl of 1 to 6 carbon atoms containing 1 to 3 halogen atoms, said halogen being independently selected from chlorine and bromine;

each Y substituent is independently selected from a group consisting of halogen, hydrogen phosphate, hydrogen sulfate, nitrate, acetate, alkali-metal phosphate, and alkali-metal sulfate;

each R substituent is independently selected from the group consisting of hydrogen, alkyl and haloalkyl, said alkyl containing 1 to 3 carbon atoms and said haloalkyl of 1 to 3 carbon atoms containing 1 to 3 halogen atoms, said halogen being selected from chlorine and bromine; and

n is an integer from 2 to 4.

9. A flame retardant polymeric composition comprising a polymer selected from the group comprised of polyurethane, polyester, styrenic polymers, polyamides, cellulosic polymers, and epoxy polymers and a flame retarding amount of bromophenyl isothiuronium salts of the formula:



wherein:

each X substituent is independently selected from a group consisting of hydrogen, chlorine, bromine, alkyl, and haloalkyl, said alkyl containing 1 to 6 carbon atoms and said haloalkyl of 1 to 6 carbon atoms containing 1 to 3 halogen atoms, said halogen being independently selected from chlorine and bromine;

each Y substituent is independently selected from a group consisting of halogen, hydrogen phosphate, hydrogen sulfate, nitrate, acetate, alkali-metal phosphate, and alkali-metal sulfate;

each R substituent is independently selected from the group consisting of hydrogen, alkyl and haloalkyl, said alkyl containing 1 to 3 carbon atoms and said haloalkyl of 1 to 3 carbon atoms containing 1 to 3 halogen atoms, said halogen being selected from chlorine and bromine; and

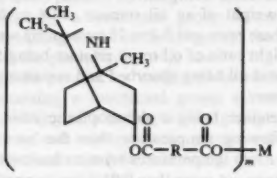
n is an integer from 1 to 5.

4,051,102
BICYCLIC HINDERED AMINO ACIDS, METAL SALTS THEREOF AND STABILIZED COMPOSITIONS

Chester E. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 429,236, Dec. 28, 1973, Pat. No. 3,879,396. This application Jan. 29, 1975, Ser. No. 545,259
Int. Cl.[2] C07D 221/22; C08K 5/34; C09K 15/30
U.S. Cl. 260—45.8 N 14 Claims

1. A composition of matter stabilized against ultraviolet deterioration which comprises a synthetic organic polymer normally subject to ultraviolet deterioration containing from 0.005 to 5% of a stabilizing compound of the formula



wherein

R is straight- or branched-chain alkylene having 1 to 20 carbon atoms,

M is hydrogen or a metal selected from the group consisting of barium, nickel, manganese, calcium, zinc, iron, sodium, cobalt, tin, and dialkyl tin, and

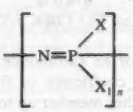
m has a value of from 1 to 4, the value of m being the same as the available valence of M.

4,051,103
STABILIZATION OF POLYFLUOROPHOSPHAZENES WITH ZINC HIPPURATE

Delmar Frederick Lohr, Jr., Akron, and Jung Wong Kang, Clinton, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Feb. 23, 1977, Ser. No. 771,231
Int. Cl.[2] C08K 5/09
U.S. Cl. 260—45.75 W 11 Claims

1. A polyphosphazene composition stabilized against thermal aging comprising (1) a polyphosphazene represented by the general formula:



wherein *n* represents an integer from 20 up to about 50,000 and X and X_1 each represent a monovalent substituent selected from the groups consisting of alkoxy, substituted alkoxy, aryloxy, substituted aryloxy, hydroxy, and amino, and X and X_1 are randomly distributed along the —P=N— backbone and the polyphosphazene includes one or two or more randomly distributed groups, and (2) a stabilizer consisting of an organic compound compatible with said polyphosphazene and present in an amount sufficient to stabilize said polyphosphazene against thermal degradation, said organic compound being zinc bis hippurate.

4,051,104
BENZOYLOXYBENZOATES AND COMPOSITIONS STABILIZED THEREWITH

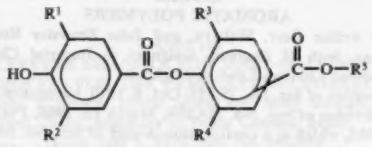
John D. Spivack, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 318,324, Dec. 26, 1972, abandoned. This application Mar. 28, 1975, Ser. No. 563,251

Int. Cl.[2] C07C *69/76*

U.S. Cl. 260—45.85 B **15 Claims**

1. A benzoyloxybenzoate having the structure



wherein

R^1, R^2, R^3, and R^4 are tert-butyl groups,

R^5 is alkyl group having up tp 30 carbon atoms, phenyl or alkyl substituted phenyl having up to 24 carbon atoms.

4,051,105
PLASTIC COMPOSITIONS

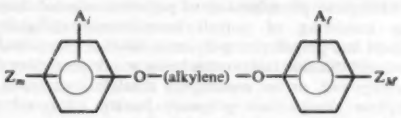
Arnold L. Anderson, and Robert J. Nulph, both of Alma, Mich., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 260,240, June 6, 1972, abandoned. This application Feb. 8, 1973, Ser. No. 330,837

Int. Cl.[2] C08L *25/10, 25/12*

U.S. Cl. 260—45.95 G **14 Claims**

1. A Plastic composition comprising acrylonitrile-butadiene-styrene polymer and a flame retardant, said flame retardant consisting of a compound having the formula



wherein Z is bromine; *m* is an integer having a value of 1–5 and *m'* is an integer having a value of 0–4; *i* is an integer having a value of 0–2 and *i'* is an integer having a value of 1–5; alkylene is a straight or branched chain alkylene group having from 1 to 6 carbon atoms; and A is chlorine.

4,051,106
HIGH MOLECULAR WEIGHT COPOLYESTER RESINS HAVING A HIGH DEGREE OF ALTERNATING STRUCTURE

Edward V. Gouinlock, Jr., Warsaw, and Jerold C. Rosenfeld, Tonawanda, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Jan. 20, 1975, Ser. No. 542,637

Int. Cl.[2] C08G *63/18, 63/42*

U.S. Cl. 260—47 C **11 Claims**

1. A process for the production of high molecular weight, linear aromatic polyesters having an alternation index above 1.6 by reacting an organic diacid halide with a hydroxyl-containing component comprising a combination of a bisphenol and 5 to 95 mol percent of a glycol, said process comprising:

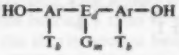
a. adding one member of the combination of a hydroxyl-containing component to the diacid halide employing at least 3 mols of diacid halide per mol of hydroxyl-containing component,

b. reacting the resulting mixture so as to form a bis-adduct,

c. removing all of the unreacted diacid halide from the bis-adduct, and

d. thereafter reacting the bis-adduct with a different member of the combination of hydroxyl-containing component so as to form the desired high molecular weight linear polyester,

and wherein the diacid halide is terephthaloyl chloride, isophthaloyl chloride or a mixture thereof, the glycol has 2-20 carbon atoms, and the bisphenol has the formula



in which Ar is aromatic, each T is independently selected from the group consisting of halogen, G or OG, each G is independently selected from the group consisting of alkyl, aryl, haloaryl, haloalkylaryl, alklaryl, cycloalkyl, halocycloalkyl, and haloalkyl, E is a bivalent alkylene, haloalkylene, cycloalkylene, halocycloalkylene, arylene, haloarylene, —O—, —S—, —SO—, —SO_2—, —SO_3—, —CO—,

or GN <, *m* is 0 to the number of replaceable hydrogen atoms on Ar, and *d* d is 0 or 1.

4,051,107
MICROSTRUCTURED HIGH MOLECULAR WEIGHT-LOW VISCOSITY POLYESTER POLYMERS

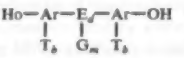
Joseph A. Pawlak, Cheektowaga; Anthony L. Lemper, Amherst, and Victor A. Pattison, Clarence Center, all of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Jan. 20, 1975, Ser. No. 542,636

Int. Cl.[2] C08G *63/40*

U.S. Cl. 260—47 C **13 Claims**

1. In the solution polymerization process for the production of linear aromatic polyesters by reacting an organic diacid halide with a hydroxyl-containing component in the presence of a base catalyst, the improvement which comprises adding a hydroxyl-containing component comprising a combination of a bisphenol and 5 to about 95 mol percent of a glycol, to the diacid halide, wherein one member of the combination is added to and reacted with the diacid halide and thereafter a different member of the combination is added and reacted with the diacid halide, and the reaction is conducted at a temperature in the range of 0° C. to 40° C. to produce a polyester having an intrinsic viscosity of at least 0.6 dl/g in sym-tetrachloroethane at 30° C and an alternation index of about 1.1 to 1.6; wherein the diacid halide is terephthaloyl chloride, isophthaloyl chloride or a mixture thereof, the glycol has 2–20 carbon atoms, and the bisphenol has the formula



in which Ar is aromatic, each T is independently selected from the group consisting of halogen, G and OG, each G is independently selected from the group consisting of alkyl, aryl, haloaryl, haloalkylaryl, alkylaryl, cycloalkyl, halocycloalkyl, and haloalkyl, E is a bivalent alkylene, haloalkylene, cycloalkylene, halocycloalkylene, arylene, haloarylene, —O—, —S—, —SO—, —SO_2—, —SO_3—, —CO—,

or GN<, *m* is 0 to the number of replaceable hydrogen atoms on E, each *b* is 0 to the number of replaceable hydrogen atoms on Ar, and *d* is 0 or 1.

4,051,108

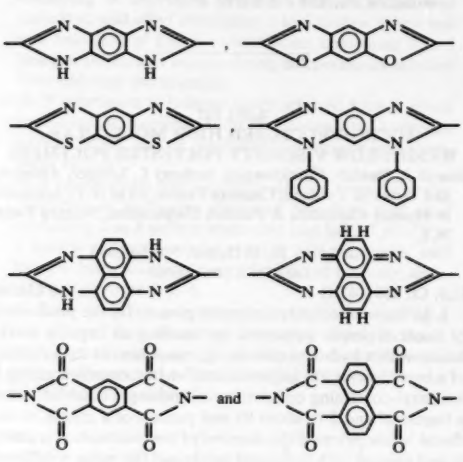
PREPARATION OF FILMS AND COATINGS OF PARA ORDERED AROMATIC HETEROCYCLIC POLYMERS

Thaddeus E. Helminiak, Dayton, and Fred E. Arnold, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

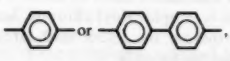
Filed Dec. 5, 1975, Ser. No. 638,211
Int. Cl.[2] C08G *73/10, 73/18, 73/22*
U.S. Cl. 260—47 CP **10 Claims**

1. A method of fabricating a composite film consisting of a para ordered aromatic heterocyclic polymer having the following formula:

where Z is a heterocyclic selected from the group consisting of



where Ar is



and *n* is an integer having a value such that the polymer has an inherent viscosity of at least 2, said method comprising the following steps:

a. mixing a solution consisting of the polymer in a solvent therefor wth a non-solvent for the polymer having a boiling point up to about 100° C and being selected from the group consisting of a hydrocarbon and an alcohol, the amount of non-solvent mixed with the solution being sufficient to precipitate the polymer from solution, thereby precipitating the polymer in the form of two dimensional, microscopic sheets;

b. separating the microscopic sheets from the resulting mixture while maintaining the sheets wetted with the non-solvent;

c. mixing the wetted microscopic sheets with the non-solvent so as to provide a dispersion containing about 0.1 to 5 grams of the sheets per 100 milliliters of non-solvent;

d. collecting from the dispersion at least one layer of the microscopic sheets; and

e. evaporating non-solvent from the sheets so that they coalesce and form a composite film.

4,051,109

AROMATIC POLYMERS

Dennis Arthur Barr, Welwyn, and John Brewster Rose, St. Albans, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 79,358, Oct. 8, 1970, abandoned, which is a division of Ser. No. 714,899, March 21, 1968, Pat. No. 3,634,355, which is a continuation-in-part of Ser. No. 580,290, Sept. 19, 1966, abandoned. This application Feb. 26, 1973, Ser. No. 335,902
Int. Cl.[2] C08G *65/40, 75/20*
U.S. Cl. 260—49 **5 Claims**

1. A solid alkali metal salt of a member of the group consisting of 4-(4-halogenophenylsulfonyl) phenol and 4-(4-halogenobenzoyl) phenol, said salt being polymerizable by condensation polymerization.

4,051,110

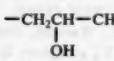
METHYLENE PHOSPHONATES OF POLYMERIZED POLYALKYLENEPOLYAMINES

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Continuation of Ser. No. 160,106, July 6, 1971, abandoned. This application Apr. 22, 1976, Ser. No. 679,389
Int. Cl.[2] C08G *12/06*
U.S. Cl. 260—72 R **8 Claims**

1. Methylene phosphonates of polymers selected from the group consisting of polyalkylenepolyamine-epihalohydrin polymers and polyalkylenepolyamine-dihalide compound polymers, said dihalide compounds being an alkylene ether dihalide compound, or an unsaturated dihalide compound, said methylene phosphonate polymers having nitrogen-bonded methylene phosphonate units of the formula

where M is alkali metal, alkaline earth metal, hydrogen, alkyl ammonium or ammonium, the terminal nitrogen atoms of said methylene phosphonate polymers having no more than one methylene phosphonate group attached thereto, the remaining valence of the terminal nitrogen atom having attached thereto the group



a divalent aliphatic ether radical or a divalent unsaturated aliphatic radical, said polymers being those having controlled crosslinking so that they are soluble in, dispersible in or soluble and dispersible in an aqueous medium.

4,051,111

INJECTION MOLDABLE POLYURETHANES

John Ambrose Holloway, Sheffield Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Aug. 20, 1976, Ser. No. 716,195
Int. Cl.[2] C08G *18/28, 18/00*
U.S. Cl. 260—75 NP **4 Claims**

1. Polyurethanes having low temperature impact and elevated heat distortion resistance with a Vicat value greater than 115° C., stiffness at 160° F. of greater than 4,000 psi and a 250°

oven sag of less than 50 mm, prepared by reacting a hydroxyl-terminated polyester or polylactone macroglycol having a molecular weight greater than 2800 to about 8000, an aliphatic diol containing 2 to 6 carbon atoms present in amount so that the average hydroxyl molecular weight of a mixture of the hydroxyl-terminated macroglycol and butanediol is about 450 to less than about 650, and more than a molar equivalent of a cyclic diisocyanate, reacted together at a temperature below 160° C. in two stages, first at a temperature of greater than 50° C. to less than 100° C. and then at less than 160° C. to substantially complete the polyurethane reaction.

4,051,112

POLYESTER GRANULE FOR MELT-SHAPING AND PROCESS FOR THE PREPARATION THEREOF

Takatoshi Kuratsuji; Hiroo Inata, and Shoji Kawase, all of Iwakuni, Japan, assignors to Teijin Limited, Japan

Filed July 1, 1975, Ser. No. 592,312
Claims priority, application Japan, July 5, 1974, 49-76416
Int. Cl.[2] C08G *63/70*
U.S. Cl. 260—75 T **5 Claims**

1. Polyester granule for melt-shaping which is composed of a difficultly crystallizable copolyester having a minimum time for half-crystallization of at least 1 minute, and having surfaces resulting from cutting by a cutter,
wherein:

i. said polyester granule has an intrinsic viscosity of at least 0.55 (as measured in o-chlorophenol at 35° C),

ii. said polyester granule has on its surface an oriented portion having an N-value of at least 0.04, the N-value being calculated by equation (1):

$$N = n\lambda/d \quad (1)$$

in which n is the number of interference fringes caused by double refraction counted upon the observation through a polarizing microscope using a light source of the wavelength λ (microns), and
d is the thickness (microns) of a sample prepared by slicing the granule to a predetermined thickness including a part of the cut surface of the granule and

iii. the inside of the polyester granule other than the said surface portion has an N-value of not higher than 0.02,

said cutting being performed under conditions which will control the surface temperature t (° C) of the extrudate to satisfy equation (2):

$$Tg + 30° \text{ C} \geqq t > Tg - 15° \text{ C} \quad (2)$$

in which Tg is the second order transition temperature (° C) of the extrudate.

4,051,113

EXTRACTION OF POLYLACTAMS

Ernst Kissel; Eckart Neumann; Ernst Guenther, all of Ludwigshafen; Guenter Valentin, Ruchheim, and Werner Hoerauf, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Aug. 28, 1973, Ser. No. 392,243
Claims priority, application Germany, Aug. 30, 1972, 2242641
Int. Cl.[2] C08G *69/46*
U.S. Cl. 260—78 L **7 Claims**

1. A process for the extraction of monomer-containing and-/or oligomer-containing polylactam granules which comprises continuously extracting polylactam granules with a countercurrent of water at temperatures above 80° C, under the following conditions:

a. the water flows upwardly through a substantially vertical extraction zone at a mean of from 0.5 to 20 cm/min and the polylactam granules pass downwardly through said extraction zone at a rate of from 0.2 to 5 cm/min,

b. the temperature at the upper end of the extraction zone is higher than at its lower end,

c. the extraction zone is divided into subzones by at least one heating zone so that the density of the water containing extractables in an upper subzone is lower than that of the water contained in the subzone immediately below by at least 0.0002, and

d. the uppermost heating zone divides the entire extraction zone into lengths bearing a ratio to each other of from 50:50 to 85:15, the shorter section being at the upper end of the extraction zone and said heating zone or the total of said heating zones constitutes 1/7 to 1/20 of the length of the vertical exraction zone.

4,051,114

VEGETABLE PROTEIN ISOLATE AND METHOD OF PRODUCING SAME

William D. Goodwin, Atlanta, Ga., assignor to Introtech, Washington, D.C.

Filed May 13, 1975, Ser. No. 576,974
Int. Cl.[2] A23J *1/14*
U.S. Cl. 260—123.5 **7 Claims**

1. A process for producing a protein composition from rapeseed which is crushed and admixed with water, subjecting the mixture of rapeseed substance admixed with water to high intensity agitation, refluxing the resultant mixture with N,N, dimethylformamide (DMF) for a sufficient time to solubilize and extract the protein from the mixture, and thereafter recovering the protein therefrom.

4,051,115

PROCESS FOR THE PRODUCTION OF LIGNIN SILICATE AND LIGNIN SILICOFORMATE

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 598,999, July 25, 1975, abandoned. This application Aug. 18, 1976, Ser. No. 715,410
Int. Cl.[2] C07G *1/00*
U.S. Cl. 260—124 R **8 Claims**

1. The process for the production of sulfate lignin silicoformate and sulfate lignin silicate by the following steps:

a. dry granular alkali metal metasilicate is slowly added to concentrated mineral acid in the ratio of 1 to 1 mols over a period fo 15 to 45 minutes, while agitating and keeping the temperature between 25° to 85° C; the chemical reaction is completed in 4 to 12 hours, thereby

b. producing a white granular mixture of silicoformic acid, metasilicic acid and salt; then by

c. washing with water and filtering, the salt is removed, thereby

d. recovering silicoformic acid and metasilicic acid; then

e. a residue of alkali metal carbonate is added to the silicoformic acid and metasilicic acid by adding an aqueous solution containing 10% to 25% alkali metal carbonate until the pH is 9 to 11, then filtering and air drying at 25° to 85° C; then

f. mixing about 1 to 2 parts by weight of the mixture of silicoformic acid and metasilicic acid with about 3 parts by weight of a lignin compound, then heating the mixture to 50° to 100° C while agitating for 20 to 60 minutes, thereby

g. producing sulfate lignin silicoformate and sulfate lignin silicate.

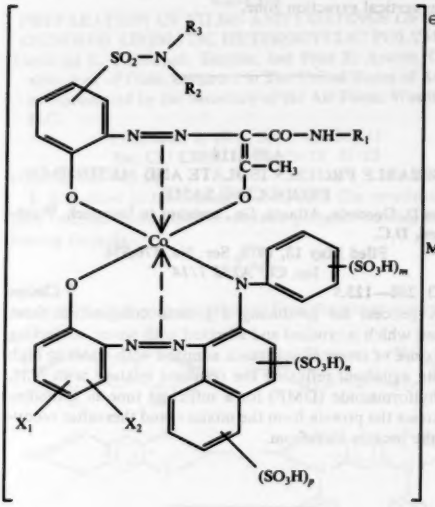
4,051,116

ASSYMMETRICAL 1:2 COBALT COMPLEXES OF METALLIZABLE MONOAZO COMPOUNDS HAVING ONE SULFO GROUP PER COMPLEX

Jacky Dore, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 189,768, Oct. 15, 1971, abandoned. This application Dec. 17, 1974, Ser. No. 533,521
Int. Cl.[2] C09B *45/10, 45/20, 45/30;* D06P *1/10*
U.S. Cl. 260—145 A 20 Claims

1. A complex of the formula



wherein

R_1 is alkyl of 1 to 12 carbon atoms, substituted alkyl wherein the alkyl chain has 1 to 12 carbon atoms and each substituent is independently halo, cyano or lower alkoxy, cyclohexyl, phenyl or substituted phenyl wherein each substituent is independently halo, lower alkyl, lower alkoxy, cyano, carboxy or lower alkoxy carbonyl,

each of R_2 and R_3 is independently hydrogen, lower alkyl or substituted lower alkyl wherein each substituent is independently halo, hydroxy or lower alkoxy,

each of X_1 and X_2 is independently halo, nitro, trifluoromethyl, alkyl of 1 to 6 carbon atoms, substituted alkyl, alkoxy of 1 to 6 carbon atoms or substituted alkoxy, wherein each alkyl chain of substituted alkyl and alkoxy chain of substituted alkoxy independently has 1 to 6 carbon atoms and each substituent is independently halo, trifluoromethyl or cyano,

M^{30} is lithium, sodium, potassium or ammonium,

m is 0 or 1,

n is 0 or 1, and

p is 0 or 1,

with the proviso that the sum of *m, n* and *p* is 1, wherein each halo is independently chloro or bromo.

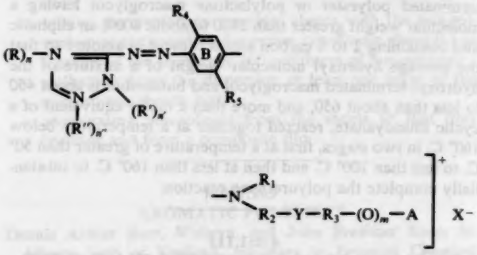
4,051,117

TRIAZOLE-AZO-PHENYL CATIONIC DYESTUFFS

Hans-Peter Kuhlthau, Leverkusen, and Hermann Beecken, Bergisch-Gladbach, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 1, 1974, Ser. No. 520,211
Claims priority, application Germany, Nov. 3, 1973, 2355076
Int. Cl.[2] C09B *29/08, 29/26;* D06P *1/08, 1/10*
U.S. Cl. 260—146 R 22 Claims

1. Cationic dyestuff of the formula



wherein

R, R′, R″, and R_1 independently of one another are C_1–C_6 alkyl unsubstituted or substituted with carboxyl, halogen, hydroxyl, C_1–C_4 alkoxy, cyano, C_1–C_4 alkoxy carbonyl, or carbonamide; cyclopentyl unsubstituted or substituted with halogen or C_1–C_6 alkyl; cyclohexyl, unsubstituted or substituted with halogen or C_1–C_6 alkyl; benzyl unsubstituted or substituted with halogen or C_1–C_4 alkyl; 2-phenyl ethyl unsubstituted or substituted in the phenyl nucleus with halogen or C_1–C_4 alkyl; β-phenyl-β-hydroxyethyl unsubstituted or substituted in the phenyl nucleus with halogen or C_1–C_4 alkyl; 2-phenylpropyl-(2) unsubstituted or substituted in the phenyl nucleus with halogen or C_1–C_4 alkyl; or R_1 is cyclised onto ring B to form pyrroline or tetrahydropyridine, each of which is unsubstituted or substituted with one or more C_1–C_4-alkyl radicals;

R_2 is

R_6 is hydrogen, methyl, ethyl, methoxymethyl, ethoxymethyl, propoxymethyl, butoxymethyl, allyloxymethyl, phenyl, or phenoxymethyl;

R_7 is hydrogen, methyl, ethyl, methoxymethyl, ethoxymethyl, propoxymethyl, butoxymethyl, allyloxymethyl, phenyl, phenoxymethyl, —Y—A, [—O—$(CH_2)q$—$(O)_m$—A] or chloromethyl, with the proviso that R_7 is [—Y—A] only when [—Y—R_3—$(O)_m$—A] is [—Y—A];

that R_7 is [—Y—A] only when [—Y—R_3—$(O)_m$—A] is [—Y—A];

that R_7 is [—O—$(CH_2)_q$—$(O)_m$—A], only when [—Y—R_3—$(O)_m$—A] is [—O—$(CH_2)_q$—$(O)_m$—A];

q is a number from 1 to 4;

R_8 is hydrogen or methyl;

p is a number from 1 to 6;

Y is oxygen or sulfur;

R_3 is a direct bond or C_1–C_6 alkylene, —CO—, or —CONH—;

R_4 is hydrogen, halogen, C_1–C_6-alkyl, C_1–C_6 alkoxy, cyano, trifluoromethyl, phenoxy, benzyloxy, acetylamino, propionylamino, benzoylamino, methylsulfonylamino, ethylsulfonylamino, phenylsulfonylamino, C_1–C_4 alkylcarbonyloxy, benzoyloxy, or C_1–C_4 alkylsulfonyl;

R_5 is hydrogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, phenoxy, benzyloxy, acetylamino, propionylamino, benzoylamino, methylsulfonylamino, ethylsulfonylamino, phenyl sulfonylamino, C_1–C_4 alkyl carbonyloxy, benzoyloxy, or C_1–C_4 alkylsulfonyl;

A is cyclohexyl, methyl, borneyl, tetrahydronaphthyl, decahydronaphthyl, phenyl, naphthyl, 1,2,4-triazolyl-(3), benzthiazolyl-(2) or benzoxazolyl-(2), each of which are unsubstituted or substituted with C_1–C_{12} alkyl, C_1–C_6 alkoxy, halogen, C_1–C_4 alkoxycarbonyl, phenyl, benzyl, 2-phenylethyl, 2-phenylpropyl, C_1–C_4-alkylsulfonyl, or phenylsulphonyl;

X^- is an anion;

n, n', and n'' independently of one another are 0 or 1;
m is 0 or 1, with the proviso that the sum $n+n'+n''=2$ and that m is 1 only if R_3 is alkylene.

4,051,118

WATER-SOLUBLE DISAZO DYESTUFFS CONTAINING A 3- OR 4-[PYRAZOLYLENE-(1)-BENZOYLAMINO]-6-SULPHOPHENYL MOIETY

Hans Ackermann, Riehen, and Fabio Beffa, Basel, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

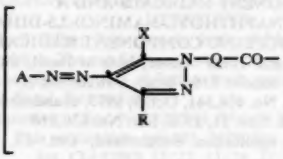
Continuation of Ser. No. 429,773, Jan. 2, 1974, abandoned, which is a continuation of Ser. No. 186,761, Oct. 5, 1971, abandoned, which is a division of Ser. No. 753,876, Aug. 20, 1968, Pat. No. 3,697,500. This application Apr. 8, 1975, Ser. No. 566,520

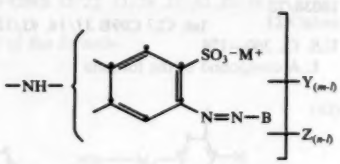
Claims priority, application Switzerland, Aug. 21, 1967, 11738/67

Int. Cl.[2] **C09B** *62/08, 62/24, 62/74, 62/82*

U.S. Cl. 260—153 **8 Claims**

1. A dyestuff of the formula





wherein

A represents phenyl, naphthyl or phenyl or naphthyl substituted by lower alkyl or sulphamoyl,

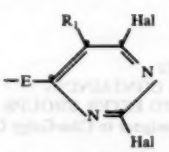
B represents phenyl, lower alkyl-phenyl, naphthyl, phenol, lower alkylphenol, naphthol, benzoylaminonaphthol, N-methyl-N'-m-chloro-phenyl barbituric acid, or di-(phenylamino) malonic acid,

Q represents 1,3- or 1,4-phenylene or 1,3- or 1,4-phenylene substituted by lower alkyl, chloro or bromo,

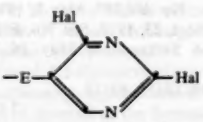
R represents lower alkyl or COO^-M^+,

X represents hydroxy or NH_2,

Y represents a group directly linked to a ring carbon atom of A or B and has the formula

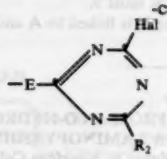


(I)

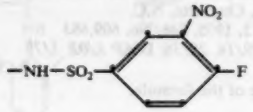


(II)

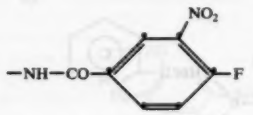
-continued



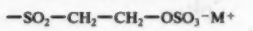
(III)



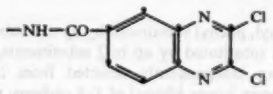
(IV)



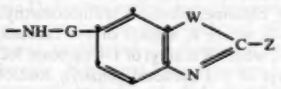
(V)



(VI)

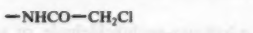


(VII)

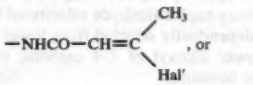


(VIII)

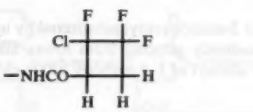
in which G is CO or SO_2, W is O or S, and Z is Cl, Br, $SO_3^-H^+$,



(IX)

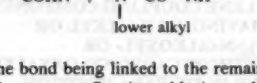


(X)



(XI)

wherein E represents —NH—,



* the bond being linked to the remainder of Y,

Hal represents fluorine, chlorine or bromine,

Hal' represents chlorine or bromine,

R_1 represents hydrogen, chlorine, bromine or cyano,

R_2 represents fluorine, chlorine, bromine, lower alkylamino, di-(lower)-alkylamino or

P representing 1 or 2,

Z represents $SO_3^-M^+$ or COO^-M^+ linked to a ring carbon of A, Q or B

M^+ represents hydrogen, sodium or potassium,

m represents a positive integer of at most 3, and

n represents a positive integer of at most 5,
and wherein which when *m* is 3, one Y is linked to A and the other to B.

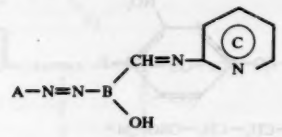
4,051,119

AZOMETHINE DYES DERIVED FROM AN O-HYDROXY AROMATIC ALDEHYDE AND A 2-AMINOPYRIDINE

Raouf Botros, Beech Creek, Pa., assignor to American Color & Chemical Corporation, Charlotte, N.C.

Filed Sept. 2, 1975, Ser. No. 609,683
Int. Cl.[2] C09B *29/14, 29/36;* D06P *1/02, 3/79*
U.S. Cl. 260—156 **7 Claims**

1. An azomethine dye of the formula:



wherein:

A is phenyl, naphthyl, phenyl substituted by up to 3 substituents or naphthyl substituted by up to 2 substituents, said substituents being independently selected from lower alkyl of 1–4 carbons; lower alkoxyl of 1–4 carbons; nitro; cyano; fluorine; chlorine; bromine; trifluoromethyl; hydroxyl; RCOO—, where R is alkyl of 1–4 carbons; carboxyl; ROOC—, where R is alkyl of 1–4 carbons; RCO—, where R is alkyl of 1–4 carbons; benzoyl; RCONH—, where R is alkyl of 1–4 carbons; ArCONH—, where Ar is phenyl; or carbamyl, the nitrogen of which is unsubstituted or singly or doubly substituted by alkyl of 1–4 carbons;

B is salicylaldehyde, o-hydroxy-naphthaldehyde, or salicylaldehyde or o-hydroxy-naphthaldehyde substituted by up to 2 substituents independently selected from lower alkyl of 1–4 carbons; lower alkoxyl of 1–4 carbons; cyano; fluorine; chlorine or bromine;

and

C is 2-aminopyridyl or 2-aminopyridyl substituted by up to 2 substituents independently selected from lower alkyl of 1–4 carbons; lower alkoxyl of 1–4 carbons; nitro; chlorine or bromine.

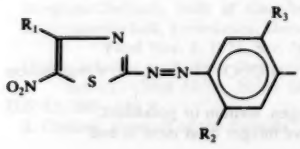
4,051,120

MONOAZO COMPOUNDS HAVING A 5-NITROTHIAZOLYL-2 DIAZO COMPONENT RADICAL AND A 1,4-PHENYLENE COUPLING COMPONENT RADICAL HAVING AN N-(ALKYL OR ALLYL)-N-(ALKOXYL- OR ALKOXYETHOXY-ETHOXYCARBONYLOXYALKYL)-AMINO GROUP IN ITS PARA POSITION

Ruedi Altermatt, Buckten, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Sept. 15, 1975, Ser. No. 613,216
Claims priority, application Switzerland, Sept. 19, 1974, 12726/74
Int. Cl.[2] C09B *29/08, 29/26;* D06P *1/18, 2/42*
U.S. Cl. 260—158 **9 Claims**

1. A compound of the formula



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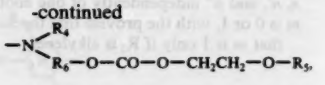


wherein

R_1 is hydrogen, C_{1-4}alkyl, phenyl or substituted phenyl having 1 to 3 substituents each of which is independently chloro, bromo or cyano, with the proviso that the maximum number of cyano groups is one,

R_2 is C_{1-4}alkyl or C_{1-4}alkoxy,

R_3 is hydrogen, C_{1-4}alkyl or C_{1-4}alkoxy,

R_4 is C_{1-4}alkyl or allyl,

R_5 is C_{1-4}alkyl or β-(C_{1-4}alkoxy) ethyl, and

R_6 is C_{2-4}alkylene, with the proviso that the nitrogen atom and the oxygen atom to which R_6 is attached are not attached to the same carbon atom thereof.

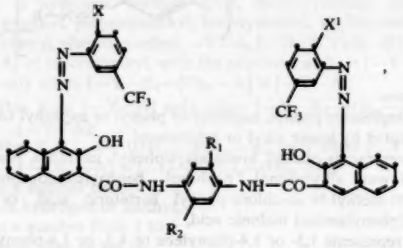
4,051,121

AZO PIGMENTS HAVING TWO 2-HALO-5-TRIFLUOROMETHYLPHENYL DIAZO COMPONENT RADICALS AND A BIS-(2-HYDROXYNAPHTHOYL-3-AMINO)-2,5-DIHALOBENZENE COUPLING COMPONENT RADICAL

Boris Tcherkinsky, and Hans Wasem, both of Basel, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 404,341, Oct. 9, 1973, abandoned. This application Nov. 11, 1975, Ser. No. 630,810
Claims priority, application Switzerland, Oct. 13, 1973, 15036/73
Int. Cl.[2] C09B *33/14, 43/12*
U.S. Cl. 260—174 **13 Claims**

1. A compound of the formula



wherein each of X, X', R_1 and R_2 is independently fluoro, chloro or bromo.

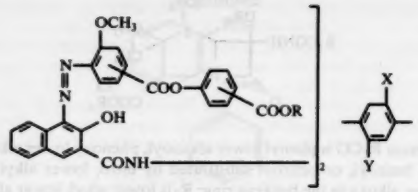
4,051,122

DISAZO PIGMENTS CONTAINING TETRACARBOXYLIC ACID ESTER GROUPS

Karl Ronco, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 466,357, May 2, 1974, abandoned. This application Sept. 23, 1975, Ser. No. 615,851
Claims priority, application Switzerland, May 16, 1973, 6966/73
Int. Cl.[2] C09B *33/14, 43/12*
U.S. Cl. 260—174 **7 Claims**

1. Disazo pigment of the formula



wherein R represents alkyl containing 1 to 6 carbon atoms, cyclohexyl or phenyl, and X and Y represent hydrogen, halogen, alkyl containing 1 to 4 carbon atoms or alkoxy containing 1 to 4 carbon atoms.

4,051,123

SULFONIC-ACID-GROUP CONTAINING DISAZO DYESTUFFS

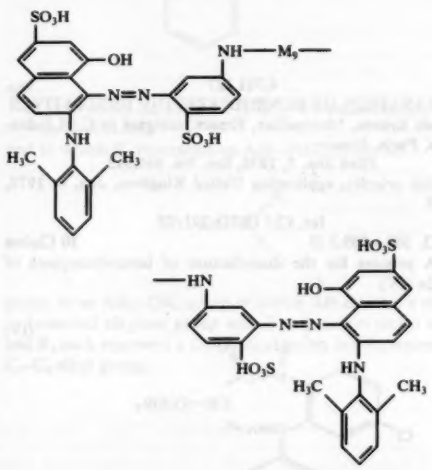
Bernhard Piller; John Lenoir, both of Marly-le-Petit; Alfred Froehlich; Thomas Stauner, both of Marly-le-Grand, and Paul Tschopp, Marly, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 238,944, March 28, 1972, abandoned. This application Aug. 21, 1975, Ser. No. 606,395

Int. Cl.[2] C09B *35/22, 35/24, 35/30, 35/34*

U.S. Cl. 260—178 **12 Claims**

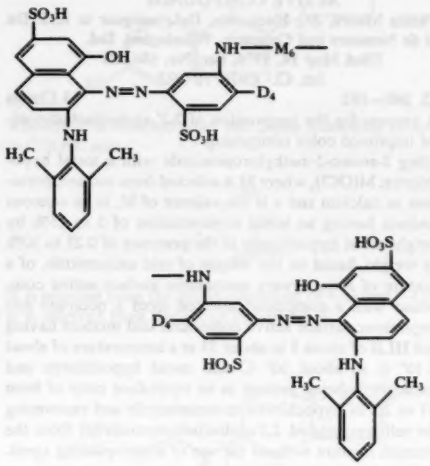
1. Azo dyestuff of the formula



(XI)

wherein M_9 denotes benzophenone-4,4'-dicarbonyl, diphenylsulphone-4,4'-dicarbonyl, naphthalene-2,6-dicarbonyl, N-benzoylaniline-3,4'-dicarbonyl, N-benzoyl-2-chloroaniline-5,4'-dicarbonyl, 1,2-diphenoxyethane- 3',3''- or -4',4''-dicarbonyl or N,N'-dibenzoylethylenediamine- 4,4'-dicarbonyl.

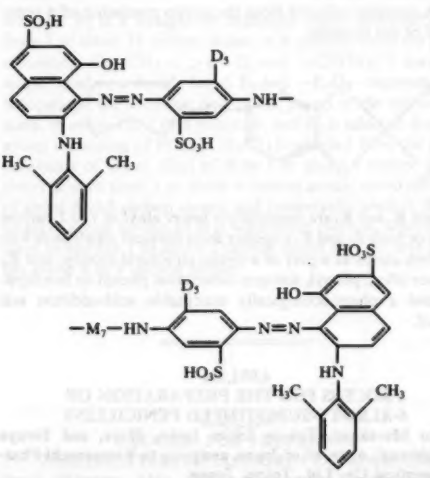
5. Azo dyestuff of the formula



(XI)

wherein D_4 denotes methyl or methoxy and M_6 denotes terephthaloyl, benzophenone-4,4'-dicarbonyl, diphenylsulphone-4,4'-dicarbonyl, naphthalene-2,6-dicarbonyl, N-benzoylaniline-3,4'-dicarbonyl, N-benzoyl-2-chloroaniline-5,4'-dicarbonyl, 1,2-diphenoxyethane-3',3''- or -4',4'''-dicarbonyl or N,N'-dibenzoylethylenediamine-4,4'-dicarbonyl.

9. Azo dyestuff of the formula



(XV)

wherein D_5 denotes chlorine or methyl, methoxy or trifluoromethyl and M_7 denotes isophthaloyl, terephthaloyl, benzophenone-4,4'-dicarbonyl, naphthalene-2,6-dicarbonyl, diphenylsulphone-4,4'-dicarbonyl, N-benzoylaniline-3,4'-dicarbonyl, N-benzoyl-2-chloroaniline-5,4'-dicarbonyl or 1,2-diphenoxyethane-3',3''- or -4',4'''-dicarbonyl or N,N'-dibenzoylethylenediamine-4,4'-dicarbonyl.

4,051,124
PROCESS FOR PRODUCING AN AZONITRILE WITH IMPROVED COLOR FROM AN AMINONITRILE IN AN AQUEOUS SYSTEM COMPRISING MIXED SURFACE ACTIVE COMPOUNDS

Earl Phillip Moore, Jr., Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 14, 1976, Ser. No. 686,508

Int. Cl.² C07C *107/02*

U.S. Cl. 260—192 **13 Claims**

1. A process for the preparation of 2,2'-azobis(isobutyronitrile) of improved color comprising

reacting 2-amino-2-methylpropionitrile with a metal hypochlorite, $M(OCl)_x$ where M is selected from sodium, potassium or calcium and x is the valence of M, in an aqueous medium having an initial concentration of 5 to 15% by weight metal hypochlorite in the presence of 0.25 to 10% by weight, based on the weight of said aminonitrile, of a mixture of a quaternary ammonium surface active compound with a compound selected from a nonionic and amphoteric surface active compound said mixture having and HLB of about 8 to about 35 at a temperature of about −10° C to about 30° C said metal hypochlorite and aminonitrile being present in an equivalent ratio of from 1:1 to 2:1 of hypochlorite to aminonitrile and recovering the self-precipitated 2,2'azobis(isobutyronitrile) from the reaction mixture without the use of a precipitating agent.

4,051,125
1,3-BENZODIOXOL DERIVATIVES

Satoru Tanaka, Higashikurume, and Hideaki Watanabe, Ushiku, both of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

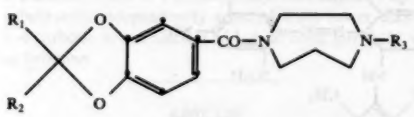
Division of Ser. No. 609,145, Aug. 29, 1975, which is a division of Ser. No. 503,515, Sept. 5, 1974, Pat. No. 3,981,864. This application May 10, 1976, Ser. No. 684,735

Claims priority, application Japan, Sept. 8, 1973, 48-100761; Sept. 8, 1973, 48-100762

Int. Cl.² C07D *243/08*

U.S. Cl. 260—239 BC **3 Claims**

1. A member selected from the group consisting of a compound of the formula:



wherein R_1 and R_2 are respectively lower alkyl of 1 to 2 carbon atoms or both R_1 and R_2 together form divalent alkylene of 4 or 5 carbon atoms as a part of a cyclic structural moiety; and R_3 is lower alkyl, phenyl, halogen-substituted phenyl or benzhydryl, and a pharmacologically acceptable acid-addition salt thereof.

4,051,126
PROCESS FOR THE PREPARATION OF 6-ALKOXY-SUBSTITUTED PENICILLINS

Masuo Murakami, Tokyo; Ichiro Isaka, Hoya, and Teruya Kashiwagi, Ageo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

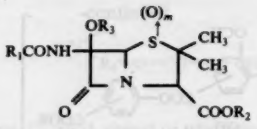
Continuation of Ser. No. 533,124, Dec. 16, 1974, abandoned. This application July 13, 1976, Ser. No. 704,770

Claims priority, application Japan, Dec. 26, 1973, 48-3259; Nov. 12, 1974, 49-130145

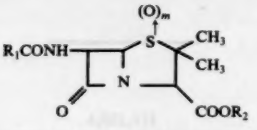
Int. Cl.² C07D *499/44, 499/58*

U.S. Cl. 260—239.1 **14 Claims**

1. A process of preparing a 6-substituted penicillin compound of the formula:



wherein R_1CO is phenyl lower alkanoyl, phenoxy lower alkanoyl, benzoyl, or benzoyl substituted by nitro, lower alkyl or lower alkoxy in the benzene ring; R_2 is lower alkyl, lower alkyl substituted by phenyl, nitro-phenyl, halo-phenyl or lower alkoxy phenyl; benzoyl, or benzoyl substituted by nitro, halo, or lower alkoxy; R_3 is lower alkyl; and m is 1 or 0 which consists essentially of the steps of (a) first adding a halogenating agent to an inert organic solvent solution of a penicillin compound of the formula:



where R_1, R_2 and m have the same meaning as defined above, under cooling at a temperature of about 0° C. to about −30° C. and then (b) adding to the reaction mixture about one equivalent of an alkali metal alcoholate of the formula

MOR_3

wherein R_3 has the same meaning as in the above formula and M represents an alkali metal in the presence of an alcohol corresponding to said alcoholate.

4,051,127
PREPARATION OF BENZODIAZEPINE DERIVATIVES

François Krausz, Montpellier, France, assignor to C M Industries, Paris, France

Filed Jan. 5, 1976, Ser. No. 646,515

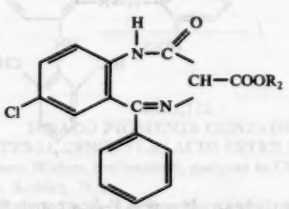
Claims priority, application United Kingdom, Jan. 6, 1975, 485/75

Int. Cl.² C07D *291/08*

U.S. Cl. 260—239.3 D **10 Claims**

1. A process for the manufacture of benzodiazepines of formula (IV)

(IV)

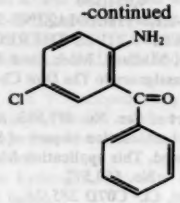


which process comprises:

i. condensing 2-amino-5-chloro-benzophenone (I) with a

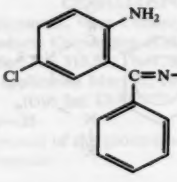
(I)

-continued

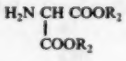


primary amine R_1—NH_2 to give an imine (II)

(II)

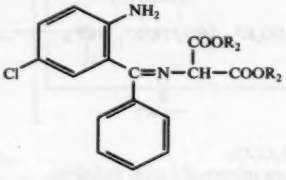


ii. reacting the imine (II) with an amino ester



to give a ketimine (III),

(III)



and

iii. converting the ketimine (III) to the benzodiazepine (IV) by cyclization,

and in which R_1 represents an Alk—NH_2 group, an

group or an Alk—OR_4 group in which Alk denotes a straight or branched alkylene group with 2 to 6 carbon atoms and R_3 and R_4 each represent a C_1–C_4 alkyl group and R_2 represents a C_1–C_4 alkyl group.

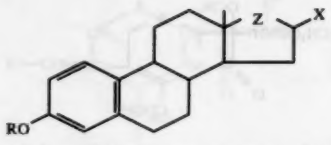
4,051,128

STEROID ETHERS

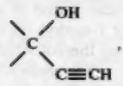
Mohammed T. Shipchandler, Terre Haute, Ind., assignor to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed July 29, 1976, Ser. No. 709,693
Int. Cl.[2] C07J *71/00*
U.S. Cl. 260—239.57 **11 Claims**

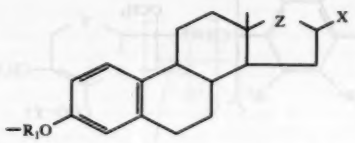
1. A compound of the formula



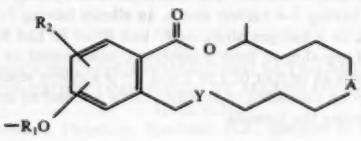
wherein Z is selected from the group consisting of >C=O, >CHOH, and



X is selected from the group consisting of —H and —OH, and R is selected from the group consisting of



and



wherein R_1 is a straight or branched chain hydrocarbon of from 1 to about 16 carbon atoms; A is selected from the group consisting of —CH_2—, >C=O, and >$CHOR_3$; Y may be a single bond or a double bond; R_2 and —R_1O— represent substituents on the aromatic ring of the group of the second formula, in either the 2 or 4 positions, and R_2 is selected from the group consisting of H and OR_3; R_3 is selected from the group consisting of lower alkyl of from 1 to about 6 carbon atoms; lower acyl of from 1 to about 6 carbon atoms; moncyclic aryl of about 6 to 8 carbon atoms; and monocyclic aralkyl, that is, an alkyl group having an aryl substituent thereon, wherein the alkyl group has 1 to about 5 carbon atoms and the aryl group has about 6 to 8 carbon atoms.

4,051,129

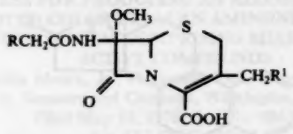
PROCESS FOR PREPARING 7-METHOXYCEPHALOSPORIN COMPOUNDS

Bunji Shimizu; Akio Saito; Masakatsu Kaneko; Hiroaki Yanagisawa, and Hideo Nakao, all of Hiromachi, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed Nov. 11, 1975, Ser. No. 630,816
Claims priority, application Japan, Nov. 30, 1974, 49-138799
Int. Cl.[2] C07D *501/04, 501/36, 501/28, 501/22*
U.S. Cl. 544—21 **7 Claims**

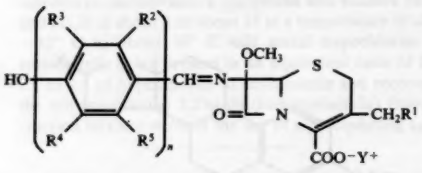
1. A process for preparing a 7α-methoxy-3-cephem-4-carboxylic acid having the formula

(I)



wherein R represents cyanomethylthio, 1-cyanoethylthio, azidomethylthio, propargylthio, 2-hydroxyethylthio, 2,3-dihydroxypropylthio, methylsulfonyl, ethylsulfonyl, cyanoethylsulfonyl, 3-isoxazolyloxy, 3-isoxazolylthio, 2-(1,3,4-thiadiazolyl)thio, 2-imidazolythio or sydnon-3-yl nd R^1 is acetoxy, carbamoyloxy or 1-methyl-1H-tetrazol-5-ylthio or a salt with the carboxyl group thereof which comprises the steps of contacting a 7β-benzylidenemino-7α-methoxy-3-cephem-4-carboxylic acid having the formula

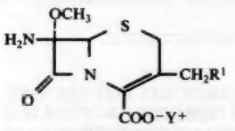
(II)



wherein R^1 is the same as defined above, R^2, R^3, R^4 and R^5 may be the same or different and each represents hydrogen atom, an alkyl having 1–4 carbon atoms, an alkoxy having 1–4 carbon atoms, or a halogen atom, or R^2 and R^3 or R^4 and R^5 may be linked together to form a saturated, unsaturated or aromatic ring, n is an integer of 1 or 2 and Y^+ is a cation selected from the group consisting of an alkali metal ion and an ammonium ion having the formula

wherein R_a, R_b, R_c and R_d can be the same or different, and each is selected from the group consisting of hydrogen alkyl having from 1 to 8 carbon atoms, cyclopentyl, cyclohexyl, cycloheptyl, phenyl, phenylalkyl wherein the alkyl has from 1 to 4 carbon atoms, R_a and R_b can be linked together with said N to form a saturated heterocyclic ring, and R_a, R_b and R_c can be linked together with said N to form a heterocyclic ring, with a hyrazine to give a 7-amino-7-methoxy-3-cephem-4-carboxylic acid having the formula

(III)



wherein R^1 and Y^+ are the same as defined above, and reacting the latter compound with a compound selected from the group consisting of a carboxylic acid having the formula

$$RCH_2COOH \qquad (IV)$$

wherein R is the same as defined above, an acid halide of (IV), an azide of (IV), an acid anhydride of (IV), a p-nitrophenyl ester of (IV), cyanomethyl ester of (IV) and a phthalimide ester of (IV).

4,051,130

4(3H)-OXOBENZO-2,1,3-THIADIAZINE-2,2-DIOXIDES AND DERIVATIVES THEREOF

Lennon H. McKendry, Midland, Mich., and Walter P. Bland, Takoma Park, Md., assignors to The Dow Chemical Company, Midland, Mich.

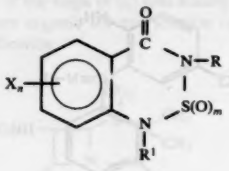
Continuation-in-part of Ser. No. 497,583, Aug. 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 398,355, Sept. 17, 1973, abandoned. This application Mar. 12, 1976, Ser. No. 660,577

Int. Cl.[2] C07D *285/16*

U.S. Cl. 544—11 **27 Claims**

1. A compound corresponding to the formula:

(I)



wherein:

each X independently represents loweralkyl, haloloweralkyl, cycloalkyl having from 3 to about 8 carbon atoms, phenyl, loweralkylphenyl, halophenyl, —SCN, —$COOR^5$,

$-YR^2$, $-SO_2R^5$, $-SO_2NR^3R^4$, $-CF_3$,

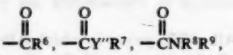
or $-Y'CF_2C(Z)_3$;

n represents an integer of 1 to 4, inclusive;

m represents an integer of 1 or 2;

R represents loweralkyl, haloloweralkyl; alkenyl, haloalkenyl, alkynyl and haloalkynyl, each of about 3 to about 6 carbon atoms; cycloalkyl of 3 to about 8 carbon atoms; phenyl, loweralkylphenyl, halophenyl, benzyl, loweralkylbenzyl, halobenzyl, loweralkoxyloweralkyl, diloweralkylaminoloweralkyl; loweralkylthioloweralkyl, or cyanoloweralkyl;

R^1 represents hydrogen,



$-SO_2R^{10}$ or $-SO_2NR^8R^9$;

R^2 and R^5 each represent alkyl of 1 to 2 carbon atoms;

R^3 represents loweralkyl;

R^4 represents hydrogen or loweralkyl;

R^6 represents loweralkyl and hololoweralkyl each having from 1 to 5 carbon atoms, alkenyl and haloalkenyl of 2 to 5 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, loweralkoxyloweralkyl and loweralkylthioloweralkyl, each of 2 to 6 carbon atoms, alkoxycarbonylalkyl of 4 to 8 carbon atoms, phenyl, loweralkylphenyl or halophenyl;

R^7 represents alkyl of 1 to 7 carbon atoms, haloalkyl of 1 to 4 carbon atoms, alkenyl and haloalkenyl of 3 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl, loweralkylphenyl or halophenyl;

R^8 represents loweralkyl of 1 to 4 carbon atoms and cycloalkyl of 3 to 6 carbon atoms;

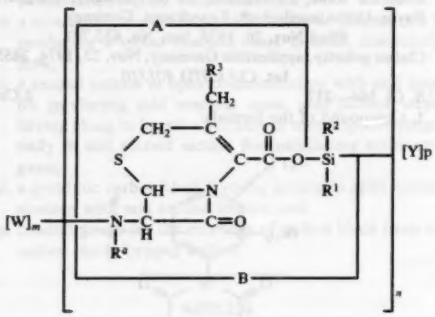
R^9 represents R^8 and alkoxy, and when taken together with R^8 and the nitrogen from which each depends, a heterocyclic ring of 4 to 8 carbon atoms;
R^{10} represents alkyl and haloalkyl, each of 1 to 7 carbon atoms;
each Y, Y' and Y''' independently represents a chalcogen group having an atomic number of from 8 to 16 inclusive;
each Z independently represents hydrogen, bromo, chloro or fluoro; and
where R^1 is hydrogen, the salts thereof with organic or inorganic bases.

4,051,131
INTERMEDIATES FOR PREPARING CEPHALOSPORINS

Charles A. Robinson, West Chester, Pa., assignor to American Home Products Corporation (Del.), New York, N.Y.

Division of Ser. No. 310,511, Nov. 29, 1972, Pat. No. 3,965,098. This application Mar. 22, 1976, Ser. No. 669,135
Int. Cl.² C07D *501/18*
U.S. Cl. 544—28 **7 Claims**

1. A compound of the group consisting of those having the following formula:



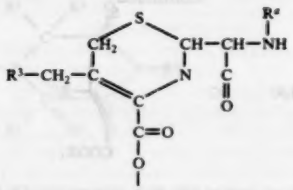
wherein:
R^1 is of the group consisting of hydrogen, lower alkyl, phenyl, loweralkylphenyl and benzyl
R^2 is of the group consisting of lower alkyl, phenyl, loweralkylphenyl and benzyl
R^3 is hydrogen or

R^a is of the group consisting of tetrazolylacetyl and sydnonylacetyl; W is of the group consisting of hydrogen and

II

wherein R^1 and R^2 have the same meaning as before, and X is halogen;
m and *p* are integers from 0 to 1 and are always equal
n is an integer from 1 to about 25;
Y is of the group consisting of halogen, and groups of the following formula:

III



wherein R^a has the same meaning as before; with the provisos that, in Formula I,

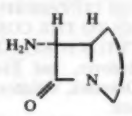
1. when *m* is *o* and *p* is 0, *n* is more than 1;
2. when *n* is more than 1, the moieties A of the additional groups B recur in random head-toward-head, head-toward-tail and tail-toward-tail disposition;
3. when W is hydrogen, *n* is 1, and Y in Formula III, then R^a is hydrogen,
4. when W is hydrogen or

4,051,132
PROCESS FOR EPIMERIZING BETA-LACTAM ANTIBIOTIC COMPOUNDS BY MEANS OF AN ACID QUENCH

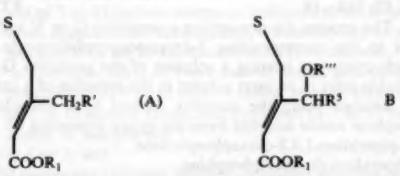
Raymond A. Firestone, Fanwood, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 436,014, Jan. 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 350,543, April 16, 1973, abandoned, Ser. No. 303,906, Nov. 6, 1972, abandoned, Ser. No. 306,066, Nov. 13, 1972, abandoned, Ser. No. 314,484, Dec. 12, 1972, abandoned, Ser. No. 319,945, Dec. 29, 1972, abandoned, and Ser. No. 340,804, March 13, 1973, abandoned, said Ser. No. 350,543, is a continuation-in-part of Ser. No. 267,858, June 30, 1972, abandoned. This application Dec. 24, 1975, Ser. No. 644,250
Int. Cl.² C07D *501/04*
U.S. Cl. 544—20 **22 Claims**

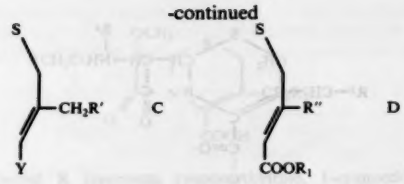
1. The process of epimerizing a compound having the formula



wherein the symbol indicated as a curved broken line represents the following:

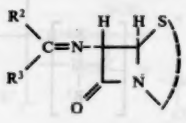


-continued



wherein R_1 is an easily removable ester blockingg group; R' is hydrogen, halo, loweralkanoyloxy, carbamoyloxy, furyl, thiazolyl, thiazolyl, thiadiazolyl, pyrrolyl, or tetrazolyl; each of which can be substituted with a lower alkyl substituent of 1-6 carbon atoms; R'' is phenyl, furyl, thienyl, thiazolyl, thiadiazolyl, pyridyl, pyrazolyl, or tetrazolyl; R''' is loweralkanoyl; R^5 is loweralkyl; and Y is $PO(OH)_2$ (OR^4), $SO_2(OH)$ or SO_2NH_2 in which R^4 is loweralkyl;

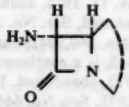
a. which comprises reacting the compound above with an aromatic or aliphatic aldehyde or ketone to yield an intermediate of the formula



wherein the broken curved line is as defined, and R^2 is loweralkyl or phenyl and R^3 is hydrogen, loweralkyl or phenyl;

b. and treating the latter intermediate with a base sufficiently strong to convert the aldimino compound to its anionic form said treatment conducted in the presence of an aprotic solvent and the optional presence of a dipolar aprotic co-solvent, followed by addition of a molecular excess of acid, a carboxylic acid having from 1–5 carbon atoms;

c. and reacting the compound thereby produced with acid in the optional presence of an amine, and recovering the product,



wherein the curved broken line is as defined above.

4,051,133

PROCESS FOR CONVERTING PENICILLIN SULFOXIDES TO THE CORRESPONDING 3-DESACETOXYCEPHALOSPORINS

Poul Borrevang, Rodovre, and Henning Borge Petersen, Lyngby, both of Denmark, assignors to Novo Industri A/S, Bagsvaerd, Denmark

Filed Jan. 2, 1976, Ser. No. 646,321

Claims priority, application United Kingdom, Jan. 3, 1975, 307/75

Int. Cl.² C07D *501/10*

U.S. Cl. 544—18 **8 Claims**

1. The process for converting a penicillin G or V sulfoxide ester to the corresponding 3-desacetoxycephalosporin ester which comprises heating a solution of the penicillin G or V sulfoxide ester in an inert solvent in the presence of a catalyst, said catalyst being the complex formed by a phosphite or phosphine amide selected from the group consisting of:

2-piperidino-1,3,2-dioxaphospholane,

Piperidino-diphenylphosphine,

2-piperidino-4,5-benzo-1,3,2-dioxaphospholane,

2-(2',6'-dimethylpiperidino-4,5-benzo-1,3,2-dioxaphospholane

2-(1'-imidazolyl)-4,5-benzo-1,3,2-dioxaphospholane, tris-(dimethylamino)-phosphine.

and the salt of a strong acid with a nitrogeneous base selected from the group consisting of:

alfa-picoline hydrobromide

alfa-picolinium methanesulfonate

pyridinium 2-trichloroethylphosphate

N,N-dimethylaniline hydrobromide

4,051,134

REACTIVE DYESTUFFS

Adolf Friedrich, Leverkusen; Horst Harnisch, Cologne, and Roderich Raue, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

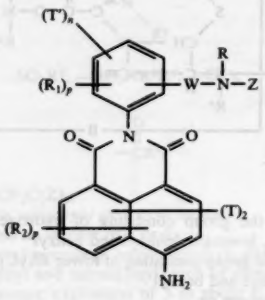
Filed Nov. 20, 1975, Ser. No. 633,781

Claims priority, application Germany, Nov. 23, 1974, 2455615

Int. Cl.² C07D *401/10*

U.S. Cl. 544—217 **2 Claims**

1. Compound of the formula:



wherein

W is a direct bond, C_1-C_4-alkylene; cyclopentylene; cyclohexylene; cyclopentylene or cyclohexylene substituted with methyl, ethyl, or propyl but each containing no more than 8 carbon atoms; or phenylene;

T and T' are sulphonic acid, sulphonic acid alkali metal salt, or sulphonic acid ammonium salt, and *n* is 0 or 1;

R is hydrogen; C_1-C_4-alkyl; C_1-C_4-alkyl substituted with hydroxyl, methoxy or ethoxy; benzyl; phenethyl; benzyl or phenethyl substituted with methyl, ethyl, methoxy, ethoxy or chlorine; phenyl; tolyl; xylyl; phenyl substituted with hydroxy, methoxy or ethoxy; cyclopentyl; cyclohexyl; or cyclopentyl or cyclohexyl substituted with methyl or ethyl if *n* is 1; or sulfo-C_1-C_4-alkyl; sulphophenyl; sulphotolyl; sulphobenzyl; sulphophenethyl; or sulfocycloalkyl if *n* is 0;

R_1 and R_2 are hydrogen, F, Cl, Br, C_1-C_6-alkyl, C_1-C_6-alkoxy, nitro, cyano, carbo-C_1-C_5-alkoxy, phenyl, or benzyl;

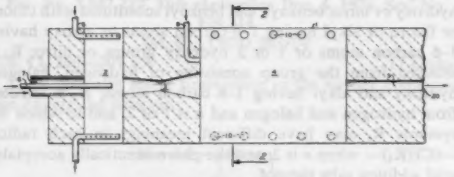
p is 1, 2 or 3; and

Z is a polyamide- or cellulose-fiber reactive group comprising at least one reactive substituent bonded to a 5-membered or 6-membered heterocyclic ring containing at least one nitrogen atom.

4,051,135
CARBON BLACK REACTOR

John W. Vanderveen, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 524,832, Nov. 18, 1974, Pat. No. 3,989,804, which is a continuation of Ser. No. 286,893, Sept. 7, 1972, abandoned. This application June 2, 1976, Ser. No. 692,072
Int. Cl.[2] C09C *1/50*
U.S. Cl. 23—259.5 7 Claims



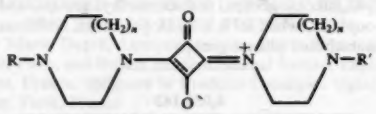
1. A carbon reactor comprising:
a. a first section with conduit means for the introduction of a plurality of reactants thereinto, said conduit means restricted to axial and radial flow with means to introduce at least one reactant with axial flow and means to introduce at least one reactant with radial flow;
b. a means in open communication with said first section for producing a mixed reactant mass in axial, non-rotating flow;
c. a second section in open communication with said means for producing said reactant mass, said second section having along its length a plurality of means spaced tangentially to said second section for introducing combustion gases;
d. a pyrolytic carbon black forming section in open communication with said second section; and
e. conduit means for the recovery of carbon black from said carbon black forming section.

4,051,136
PIPERAZINYL CYCLOBUTENONES

Carl Peter Krimmel, Wauconda, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Apr. 7, 1976, Ser. No. 674,519
Int. Cl.[2] C07D *295/02, 243/08*
U.S. Cl. 260—268 R 5 Claims

1. A compound of the formula



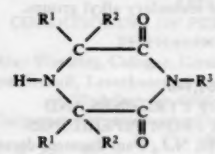
wherein R and R′ are alkyl having from 2 to 6 carbon atoms and *n* is 1 or 2.

4,051,137
SUBSTITUTED PIPERAZINE DIONES AND POLYMERIC COMPOSITIONS STABILIZED THEREBY

Chester E. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 391,200, Aug. 24, 1973, Pat. No. 3,928,357, which is a continuation-in-part of Ser. No. 237,982, March 24, 1972, abandoned. This application Nov. 19, 1975, Ser. No. 633,202
Int. Cl.[2] C07D *241/08*
U.S. Cl. 260—268 TR 1 Claim

1. A compound of the formula



wherein
R^1 and R^2 are together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted or substituted with a methyl group, and
R^3 is benzyl.

4,051,138
WATER-SOLUBLE AMINE-LINKED POLYMERIC COLORANTS

Patricia C. Wang, and Robert E. Wingard, both of Palo Alto, Calif., assignors to Dynapol, Palo Alto, Calif.

Filed Dec. 8, 1975, Ser. No. 638,730
Int. Cl.[2] C09B *5/14*
U.S. Cl. 260—278 21 Claims

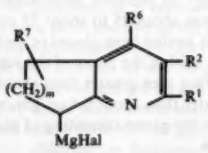
1. A water-soluble polymeric coloring composition consisting essentially of *n* units of an organic optically chromophoric group, A, and *m* units of a sulfur oxide water-solubilizing groups selected from the group consisting of sulfonate group and 2 to 4 carbon alkyl sulfonate groups attached through amine linkages selected from the group consisting of the secondary amine linkage and 1 to 4 carbon alkyl-substituted tertiary amine linkages directly to separate carbon atoms of a saturated aliphatic hydrocarbon backbone, wherein *n* is from 0.2 to 4 times *m*, the sum of *n* plus *m* is a value from 20 to 3000 and the coloring composition has a molecular weight of from 2000 to 2,000,000.

4,051,139
PYRIDINE GRIGNARD DERIVATIVES

Adrian Charles Ward Curran, Newcastle-upon-Tyne, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

Division of Ser. No. 526,353, Nov. 22, 1974, Pat. No. 3,963,722. This application Dec. 8, 1975, Ser. No. 638,384
Claims priority, application United Kingdom, Nov. 26, 1973, 54728/73; Mar. 27, 1974, 13516/74
Int. Cl.[2] C07D *221/16, 215/14, 215/06, 215/12*
U.S. Cl. 260—290 HL 10 Claims

1. A compound of formula (II)



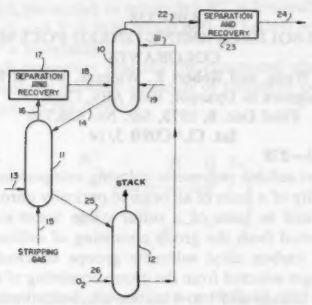
wherein
R^1, R^2 and R^6 are independently hydrogen, alkyl of 1 to 6 carbon atoms, phenylalkyl of 7 to 12 carbon atoms, phenyl, alkylphenyl of 7 to 12 carbon atoms, alkoxyphenyl of 7 to 12 carbon atoms, or halophenyl, or R^1 and R^2 taken together, are trimethylene, tetramethylene or pentamethylene or an R^7 substituted derivative thereof;
R^7 is hydrogen, alkyl of 1 to 6 carbon atoms, gem-dimethyl, phenylalkyl of 7 to 12 carbon atoms, phenyl, alkylphenyl of 7 to 12 carbon atoms, alkoxyphenyl of 7 to 12 carbon atoms, or halophenyl;
m is 1 or 3; and
Hal represents chlorine, bromine or iodine, with the proviso

that when R^1 and R^2 or R^2 and R^6 are both alkyl, they are selected from normal and secondary alkyl groups.

4,051,140
PREPARATION OF PYRIDINES AND NICOTINONITRILE FROM PIPERIDINES

Abraham P. Gelbein, Plainfield, N.J.; Paul Janssen, deceased, late of Bensberg-Refrath, Germany, by Almuth Janssen, heir; Hermann Richtzenhain, Much-Schwellenbach, Germany, assignors to The Lummus Company, Bloomfield, N.J.

Filed July 1, 1976, Ser. No. 701,693
Int. Cl.² C07D *213/24, 213/57*
U.S. Cl. 260—290 P **11 Claims**



1. A process for producing nicotinonitrile, comprising:

a. converting in a first reaction zone a member selected from the group consisting of 3-alkyl piperidines, 2,3-dialkyl piperidines, and 2,5-dialkyl piperidines to the corresponding pyridine by contacting said member with supported vanadia as a catalyst, at a temperature of from 500° F to 1000° F, said supported vanadia containing from about 25 to about 75 percent, by weight, of the vanadia, said vanadia having been placed in molten form substantially entirely within the pores of the support, the support having a surface area greater than about 50 m^2/gm and a porosity greater than about 0.4 cc/gm, said support being selected from the group consisting of gamma-alumina and silica-alumina; and

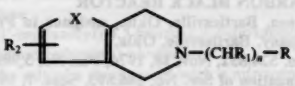
b. contacting said corresponding pyridine in a second reaction zone with ammonia at a temperature of from 575° F to 930° F in the presence of oxidized vanadia supported on a porous support to produce nicotinonitrile, said support containing from about 25 to about 75 percent, by weight, of the vanadia having been placed in molten form substantially entirely within the pores of the support, the support having a surface area greater than about 50 m^2/gm and a porosity greater than about 0.4 cc/gm, said support being selected from the group consisting of gamma-alumina and silica-alumina.

4,051,141
THIENO[3,2-C]PYRIDINE DERIVATIVES

Albert Rene Joseph Castaigne, Toulouse, France, assignor to Centre d'Etudes pour l'Industrie pharmaceutique, Toulouse, France

Division of Ser. No. 435,036, Jan. 21, 1974, abandoned. This application Feb. 20, 1976, Ser. No. 660,248
Claims priority, application France, Feb. 1, 1973, 73.03503
Int. Cl.² C07D *513/04*
U.S. Cl. 260—294.8 C **6 Claims**

1. A compound selected from the derivatives of the formula:



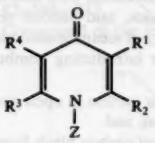
in which X is sulfur; R is selected from the group consisting of phenyl, phenyl substituted with 1 or 2 halogen atoms or alkyl having 1–6 carbon atoms or alkoxy having 1–6 carbon atoms or hydroxy or nitro, benzoyl, and benzoyl substituted with chloro or fluoro or alkyl having 1–6 carbon atoms or alkoxy having 1–6 carbon atoms or 1 or 2 hydroxy groups or nitro; R_1 is selected from the group consisting of hydrogen, halogen, hydroxy and alkyl having 1–6 carbon atoms; R_2 is selected from hydrogen and halogen and n is 1 or 2, and in which the symbols R_1 may have different meanings in each radical —(CHR_1)— when n is 2; and the pharmaceutically acceptable acid addition salts thereof.

4,051,142
1-ARYL-4-PYRIDONES

Glenn R. Carlson, North Wales, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed May 24, 1976, Ser. No. 689,219
Int. Cl.² C07D *213/57, 213/56, 213/55*
U.S. Cl. 260—294.9 **11 Claims**

1. A compound of the formula



wherein

R^1 is a carboxy group or an agronomically-acceptable salt thereof, a carb$(C_1$-$C_4)$alkoxy group, a carbamoyl group, a $(C_1$-$C_4)$alkyl or di(C_1C_4)-alkyl carbamoyl group, or a cyano group,

R^2 is a $(C_1$-$C_4)$alkyl group,

R^3 is a hydrogen atomm or a $(C_1$-$c_4)$alkyl group,

R^4 is a hydrogen atom, a $(C_1$-$C_4)$alkyl group, or a halogen atom, and

Z is a substituted phenyl group having up to three substituents selected from halogen atoms, $(C_1$-$C_4)$alkyl groups, $(C_1$-$C_4)$alkoxy groups, trifluoromethyl groups, and nitro groups, or, when R^3 is a hydrogen atom, additionally an unsubstituted phenyl group.

4,051,143
PROCESS FOR THE PRODUCTION OF α-[2-(p-CHLOROPHENOXY)-ISOBUTYRYL]-β-NICOTINOYL GLYCOL ESTER

Arthur Scherm, Bad Homburg, and Dezsö Peteri, Hammersbach, Marköbel, both of Germany, assignors to Merz & Co., Germany

Continuation of Ser. No. 610,185, Sept. 4, 1975, abandoned. This application Dec. 15, 1976, Ser. No. 750,594
Claims priority, application United Kingdom, Sept. 5, 1974, 38778/74
Int. Cl.² C07D *213/55*
U.S. Cl. 260—295.5 R **7 Claims**

1. A process for the production of α-[2-(p-chlorophenoxy)-isobutyryl]-β-nicotinoyl glycol ester in high yields which consists essentially of reacting [2-(p-chlorophenoxy)-isobutyryl]-β-chloroethyl ester with an alkali metal salt of nicotinic acid in a polar or dipolar aprotic solvent having a boiling point between about 100° C. and 200° C.

4,051,144

SINISTER-3,5-DISUBSTITUTED OXOZOLIDINES THEIR PREPARATION AND USE

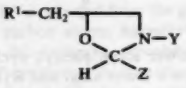
Leonard M. Weinstock, Belle Mead; Roger J. Tull, Metuchen, and Dennis M. Mulvey, Whitehouse, all of N.J., assignors to Charles E. Frosst & Co., Kirkland, Canada

Continuation of Ser. No. 283,875, Aug. 25, 1972, abandoned, which is a division of Ser. No. 172,234, Aug. 16, 1972, Pat. No. 3,718,647, which is a division of Ser. No. 818,474, April 21, 1969, Pat. No. 3,657,237. This application Dec. 4, 1974, Ser. No. 529,314

Int. Cl.[2] C07D *263/04*

U.S. Cl. 260—307 FA 17 Claims

1. An optically active oxazolidine in the sinister configuration having the structure:



wherein R^1 is hydroxy or R^3O— wherein R^3 is C_{1-16} alkylsulfonyl, benzenesulfonyl optionally having substituents selected from the group consisting of

a. an amino group,
b. 1–3 bromo groups,
c. 1–3 chloro groups,
d. a chloro and a nitro group,
e. a fluoro group,
f. a methoxy group,
g. 1–3 methyl groups and
h. a nitro group;

Z is hydrogen, benzyl, C_1-C_3 alkyl, phenyl optionally having substituents selected from the group consisting of

a. 1–3- bromo groups,
b. 1–3 chloro groups,
c. 1–3 methyl groups,
d. a methoxy group and
e. 1–3 hydroxy groups,

or Z can be furfuryl; and Y is a straight or branched chain C_1-C_5 alkyl or hydroxy substituted straight or branched chain C_1-C_5 alkyl.

4,051,145

FLUORINATED INDAZOLE DERIVATIVES AND A PROCESS FOR THEIR PREPARATION

Victor Marie Dupré, Louvres; Jacques Pierre Edmond Pechméze, Paris, and Robert Frédéric Michel Sureau, Enghien les Bains, France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

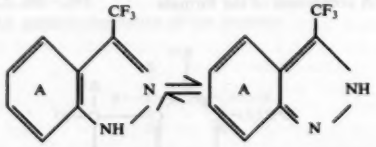
Filed Mar. 26, 1975, Ser. No. 562,062

Claims priority, application France, Mar. 29, 1974, a74.11262

Int. Cl.[2] C07D *231/56*

U.S. Cl. 548—372 6 Claims

1. Compound of the formula:



(I)

in which the nucleus A is unsubstituted or substituted by one or two nitro, amino, alkyl, alkoxy, chlorine or bromine and the alkyl and alkoxy each contain up to two carbon atoms.

4,051,146

CONDITIONING OF PERHALOGENO-COPPER PHTHALOCYANINES

Diether Wessling, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 14, 1975, Ser. No. 621,801

Claims priority, application Germany, Oct. 16, 1974, 2449231

Int. Cl.[2] C09B *47/04*

U.S. Cl. 260—314.5 2 Claims

1. Process for conditioning perhalogeno-copper phthalocyanines, characterized in that the melts obtained on halogenation of copper phthalocyanine in the presence of aluminum chloride are poured into cold water, an organic solvent selected from the group consisting of liquid benzene derivatives unsubstituted or substituted by halogen atoms, lower alkyl groups or nitro groups is added to the mixture, the whole is heated without intermediate isolation for 3 to 8 hours to temperatures between 90 and 150° C, the organic solvent is driven off in steam, the residue is filtered and the material on the filter is washed until free from salt, dried and ground.

4,051,147

1-(ARYLAMINO)-AND 1-(ARYLIMINO)-PYRROLES

Robert E. Johnson, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

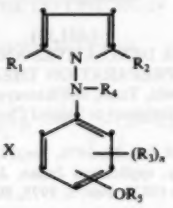
Continuation-in-part of Ser. No. 372,324, June 21, 1973, abandoned. This application June 9, 1975, Ser. No. 585,448

Claims priority, application United Kingdom, June 10, 1974, 25599/74

Int. Cl.[2] C07D *207/50*

U.S. Cl. 260—326.47 12 Claims

1. A compound having the formula:



where R_1 and R_2 are each hydrogen or each lower-alkyl, or R_1 is hydrogen and R_2 is carboxyl; R_3 is hydrogen, hydroxy, benzyloxy, halo, azido, amino, di-lower-alkylamino or lower-alkyl; R_4 is hydrogen, lower-alkanoyl, benzoyl or lower-alkyl; X represents either a benzenoid nucleus fused to the phenyl ring at the positions indicated, or it represents two hydrogen atoms or one hydrogen atom and one of the groups R_3, or two of the groups R_3; R_5 is hydrogen, lower-alkyl, lower-alkanoyl, benzoyl or benzyl; and *n* is one of the integers 1 and 2, and where the phenyl ring of the groups R_4 and R_5 when benzoyl can be substituted by lower-alkyl, lower-alkoxy or from one to two halogens, and where halo or halogen, all occurrences, represents fluorine, chlorine or bromine, and lower-alkyl, lower-alkoxy and lower-alkanoyl, all occurrences, have from one to four carbon atoms.

4,051,148

6,11-DIHYDRODIBENZO-[b.e.]-THIEPIN-11-ONE-3-CARBOXALDEHYDE

Anthony Prince, Mountain View; Otto Halpern, and Jack Ackrell, both of Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed June 18, 1976, Ser. No. 697,648

Int. Cl.[2] C07D *337/12*

U.S. Cl. 260—327 B 1 Claim

1. 6,11-dihydrodibenzo-[b.e.]-thiepin-11-one-3-carboxaldehyde.

4,051,149

6,11-DIHYDRODIBENZO-[b.e.]-THIEPIN-11-ONE-3-ACETONITRILE

Jack Ackrell, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed June 18, 1976, Ser. No. 697,651
Int. Cl.² C07D *337/12*
U.S. Cl. 260—327 B **1 Claim**

1. 6,11-Dihydrodibenzo-[b.e.]-thiepin-11-one-3-acetonitrile.

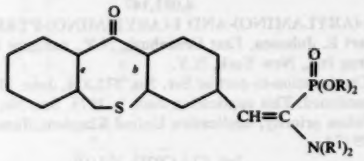
4,051,150

3-(2-DIALKYLAMINO-2-DIALKYLPHOSPHONYL-VINYL)-6,11-DIHYDRODIBENZO-[b.e.]-THIEPIN-11-ONE

Arthur F. Kluge, Los Altos, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed June 18, 1976, Ser. No. 697,652
Int. Cl.² C07D *337/12*
U.S. Cl. 260—327 B **2 Claims**

1. A compound of the formula:



wherein R and R^1 represent an alkyl radical containing from 1 to 4 carbon atoms.

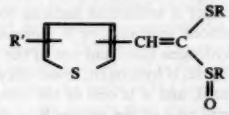
4,051,151

THIOPHENE DERIVATIVES AND PROCESS FOR PREPARATION THEREOF

Genichi Tsuchihashi, Tama, and Katsuyuki Ogura, Sagamihara, both of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

Filed Jan. 21, 1976, Ser. No. 651,112
Claims priority, application Japan, Jan. 23, 1975, 50-9297; Jan. 27, 1975, 50-10520; Feb. 3, 1975, 50-13388; Nov. 25, 1975, 50-140249
Int. Cl.² C07D *333/00, 333/12*; A61K *31/43*; A01N *9/00*
U.S. Cl. 260—329 S **7 Claims**

1. A compound of the formula



wherein R' represents a member selected from the group of hydrogen and alkyl and R represents a member selected from the group of (1) alkyl, (2) substituted alkyl wherein the substituent is halogen, hydroxy or alkoxy, (3) phenyl, and (4) substituted phenyl wherein the substituent is alkyl, alkoxy, aryl, nitro or halogen.

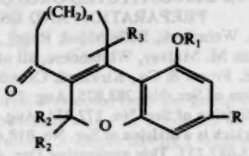
4,051,152

OXO C-RING BENZOPYRANS

Raj Kumar Razdan, Belmont; Haldean Cloyce Dalzell, Weston, both of Mass., and Patricia Herlihy, Dover, N.H., assignors to Sharps Associates, Cambridge, Mass.

Filed Jan. 7, 1976, Ser. No. 647,050
Int. Cl.² C07D *307/83, 311/80*
U.S. Cl. 260—345.3 **15 Claims**

1. A compound of the formula



wherein *n* represents 0 or 1, R is an alkyl group having 1 to 20 carbon atoms, an aryl-lower group or a cycloalkyl-lower alkyl group, R_1 is hydrogen or

wherein R_4 is lower alkyl, phenyl, cycloalkyl-lower or aryl-lower alkyl, R_2 is a lower alkyl and R_3 is hydrogen or one or two lower alkyl groups.

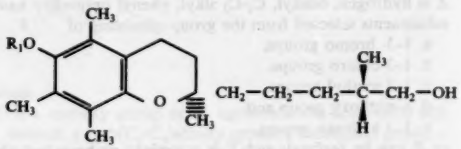
4,051,153

INTERMEDIATES IN THE SYNTHESIS OF VITAMIN E

Noal Cohen, Montclair, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 544,163, Jan. 27, 1975, abandoned. This application Dec. 9, 1975, Ser. No. 639,011
Int. Cl.² C07D *311/72*
U.S. Cl. 260—345.5 **2 Claims**

1. An optically active antipode of the formula:



wherein R_1 is benzyl, tetrahydropyranyl or t-butyl or its optically active antipode, said antipode being free of its other optically active antipode.

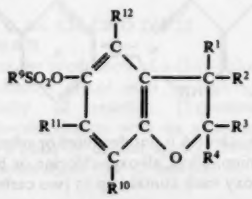
4,051,154

CERTAIN 2-SUBSTITUTED-2,3-DIHYDRO-5-BENZOFURANOL ESTERS OF CERTAIN SULFONIC ACIDS

Peter Stuart Gates, Cambridge; John Gillon, Great Shelford, and David Thomas Saggers, Saffron Walden, all of England, assignors to Fisons Limited, London, England

Continuation of Ser. No. 279,262, Aug. 9, 1972, Pat. No. 3,937,702, which is a continuation of Ser. No. 826,274, May 20, 1968, Pat. No. 3,689,507. This application May 6, 1975, Ser. No. 575,361
Claims priority, application United Kingdom, May 24, 1968, 24858/68; Feb. 8, 1969, 6951/69; Apr. 8, 1969, 17985/69
Int. Cl.² C07D *307/83*
U.S. Cl. 260—346.22 **12 Claims**

1. A compound of the formula



wherein

R^1, R^2 and R^3 are the same or different and are selected from the group consisting of hydrogen and alkyl of 1 to 6 carbon atoms,

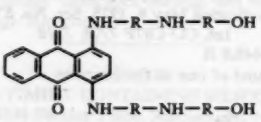
R^4 represents a member selected from the group consisting of hydroxy, alkylthio of 1 to 4 carbon atoms, phenoxy, nitrophenoxy, halophenoxy, —OSO_2R^{14}, —$OCOR^{13}$, and —O—O—R^{15} wherein R^{13} is selected from the group consisting of alkyl of 1 - 4 carbon atoms, alkenyl of 2 - 4 carbon atoms, alkynyl of 2 - 4 carbon atoms, phenyl, chlorophenyl, tolyl, alkylamino of 1 - 4 carbon atoms, dialkylamino of 2 - 8 carbon atoms, alkoxy of 1 - 6 carbon atoms, phenoxy, phenylamino, chlorophenylamino, haloalkoxy of 1- 6 carbon atoms, methoxyethoxy, chlorophenoxy, alkenyloxy of 2 - 4 carbon atoms, chloroallyloxy, alkynyloxy of 2 - 4 carbon atoms and chlorobutynyloxy, R^{14} is selected from the group consisting of alkyl of 1 - 4 carbon atoms, haloalkyl of 1 - 4 carbon atoms, phenyl, chlorophenyl, nitrophenyl, and tolyl, and R^{15} is selected from the group consisting of alkyl of 1 - 4 carbon atoms, alkenyl of 2 - 4 carbon atoms and alkynyl of 2 - 4 carbon atoms, R^9 is selected from the group consisting of alkyl of 1 - 4 carbon atoms, chloromethyl, methoxypropyl, bromoethyl, phenyl, chlorophenyl and tolyl; and R^{10}, R^{11} and R^{12} are the same or different and are selected from the group consisting of hydrogen, alkyl of 1 - 4 carbon atoms, halogen, cyano, acetyl and alkoxy of 1 - 4 carbon atoms.

4,051,155
ANTHRAQUINONE DYES

Robert C. Hoare, Rabat, Morocco, assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Dec. 15, 1975, Ser. No. 640,677
Int. Cl.² C09B *1/50*; C07C *97/24*
U.S. Cl. 260—379 **2 Claims**

1. A compound having the formula



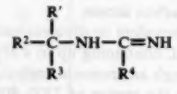
wherein R is alkylene of 1 to 4 carbon atoms.

4,051,156
N-(TRIARYL-METHYL)-AMIDINES, PROCESS FOR THE PREPARATION THEREOF AND COMPOSITIONS CONTAINING THE SAME

Lajos Guczoghy; Todor Pfliegel; Maria Puklics; Laszlo Institoris, and Jeno Seres, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt, Budapest, Hungary

Filed July 5, 1973, Ser. No. 376,445
Claims priority, application Hungary, July 5, 1972, 1250
Int. Cl.² C09B *11/10*
U.S. Cl. 260—393 **8 Claims**

1. An amidine derivative of the formula:



wherein

R', R^2, and R^3 are identical or different aryl groups; and R^4 is alkyl, aralkyl or aryl.

4,051,157
CATALYTIC ALLYLIC ALKYLATION

Barry M. Trost, and Thomas R. Verhoeven, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jan. 5, 1976, Ser. No. 646,640
Int. Cl.² C07J *9/00*
U.S. Cl. 260—397.1 **15 Claims**

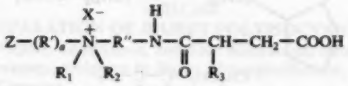
1. The method in which an organic substrate having an OR group attached through the oxygen group to a carbon alpha to a double bond carbon in which OR is hydroxy, ether or ester group, comprising the displacement of the carbon-oxygen bond which is alpha to the double bond carbon and which connects to the oxygen group, with stereochemical control for retention of configuration by reacting the substrate with a nucleophile in the presence of a palladium (Pd^*) catalyst, in which the nucleophile is selected from the group consisting of a carbon nucleophile in the form of carbanions stabilized with at least two stabilizing groups and a nitrogen nucleophile in which the carbanion is replaced with corresponding nitrogen compounds.

4,051,158
MONOMERIC EMULSION STABILIZERS DERIVED FROM ALKYL/ALKENYL SUCCINIC ANHYDRIDE

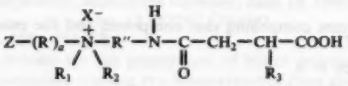
Carlos M. Samour, Wellesley, and Mildred C. Richards, Wakefield, both of Mass., assignors to The Kendall Company, Boston, Mass.

Division of Ser. No. 476,950, June 6, 1974, Pat. No. 3,959,355, which is a division of Ser. No. 309,038, Nov. 24, 1972, Pat. No. 3,839,419, which is a division of Ser. No. 40,718, May 26, 1970, Pat. No. 3,751,451, which is a continuation-in-part of Ser. No. 867,900, Oct. 20, 1969, abandoned. This application Dec. 11, 1975, Ser. No. 640,110
Int. Cl.² C07C *101/24*
U.S. Cl. 260—404.5 **7 Claims**

1. A compound having the formula



or



wherein

Z is an ethylenically unsaturated radical selected from the group consisting of acryloyloxy, methacryloyloxy, acrylamido, methacrylamido, vinyloxy, allyloxy, methallyloxy, vinylacetoxy, allylacetoxy, methallylacetoxy, 4-hydroxymaleoyloxy, 4-hydroxyfumaroyloxy, 4-hydroxymaleoylamino, 4-hydroxyfumaroylamino, 4-hydroxycitraconyloxy, 4-hydroxycitraconylamino, 4-hydroxyitaconyloxy or 4-hydroxyitaconylamino;

R' and R'' are independently selected from the group of ethylene, propylene, isopropylene, 2-hydroxypropylene, acetoxypropylene or —O—CH_2—CHR_4(O—CH_2—CHR_4)$_n$ where n is zero to 4; a = 0 or 1, and R_4 is hydrogen or methyl with the proviso that a is zero where Z is vinylacetoxy, allylacetoxy, or methallylacetoxy and a is 1 otherwise;

R_1 and R_2 are independently selected from the group consisting of alkyl having 1 to 7 carbon atoms, hydroxyalkyl having 1 to 7 carbon atoms, benzyl, R_5—O—CO—CH_2— and R_5—NH—CO—CH_2— where R_5 is hydrogen or alkyl having 1 to 4 carbon atoms;

R_3 is lipophilic aliphatic hydrocarbon group having from about 7 to about 28 carbon atoms; and

X^- is halide, alkyl sulfate wherein the alkyl moiety has 1 to 4 carbon atoms, or toluene sulfonate.

4,051,159

TRANSPARENT FRAGRANCE RELEASING COMPOSITION AND METHOD OF MAKING SAME

Michael Tsoucalas, Bergenfield; Kenneth W. Barclay, Mahwah, and Jack M. Rogers, Fairlawn, all of N.J., assignors to Avon Products, Inc., New York, N.Y.

Filed Jan. 12, 1976, Ser. No. 648,204

Int. Cl.[2] C09F *5/00*; A24F *25/00*; A61K *7/46*

U.S. Cl. 260—404.5 **16 Claims**

1. A shaped, self-supporting transparent article capable of emitting a fragrance over a sustained period comprising a substantially homogeneous mixture of from about 40 to 60% by weight of a polyamide resin formed from a polymerized fatty carboxylic acid and a polyamine, from about 35 to 55 percent by weight of a C_{14}–C_{22} straight or branch chain alkyl alcohol and from about 5 to 20 percent by weight of a fragrance material.

4,051,160

CIS-4,5-DIDEHYDRO-11-DEOXY-13,14-DIHYDRO-PG COMPOUNDS

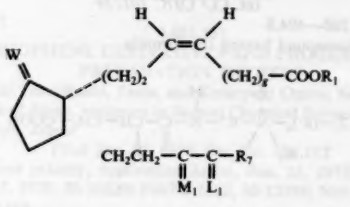
Gordon L. Bundy, Kalamazoo, and Norman A. Nelson, Galesburg, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 548,586, Feb. 10, 1975, Pat. No. 3,987,072. This application Jan. 12, 1976, Ser. No. 648,268

Int. Cl.[2] C07C *177/00*

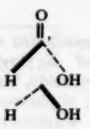
U.S. Cl. 260—413 **40 Claims**

1. A compound of the formula



or a mixture comprising that compound and the enantiomer thereof;

wherein W is



wherein g is 2 to 4, inclusive;

wherein L_1 is

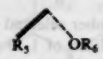
or

or a mixture of

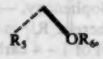
and

wherein R_3 and R_4 are hydrogen or methyl, being the same or different,

wherein M_1 is



or



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that R_5 is methyl only when R_6 is hydrogen and R_6 is methyl only when R_5 is hydrogen;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or a pharmacologically acceptable cation; and

wherein R_7 is $-(CH_2)_m-CH_3$, wherein m is one to 5, inclusive.

4,051,161

ULTRAVIOLET SCREENING AGENTS AND COATING MATERIALS CONTAINING ORGANOSILANE ESTER GROUPS

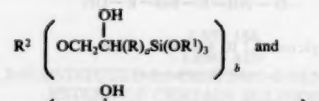
Stephen Proskow, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 289,459, Sept. 15, 1972, abandoned. This application May 8, 1975, Ser. No. 575,795

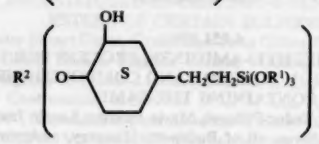
Int. Cl.[2] C07F *7/08*, *7/18*

U.S. Cl. 260—448.8 R **11 Claims**

1. A compound of one of the formulas



and



wherein

R is a divalent hydrocarbon or hydrocarbon ether radial of up to 10 carbons;

R^1 is an aliphatic hydrocarbon radical of less than 5 carbon atoms, an acyl radical of less than 5 carbon atoms, or a radical of the formula $(CH_2CH_2O)_nZ$ in which n is an integer of 1 to 8 and Z is an aliphatic hydrocarbon radical of less than 5 carbon atoms;

R^2 is a stable, monovalent or divalent carbocyclic hydroxy-aromatic radical, containing up to 4 aromatic rings joined to oxygen through an aromatic carbon, of the type which absorbs light in the region of 2500–4000 A in an amount effective for stabilizing polymers against ultraviolet light;

a is 0 or 1; and

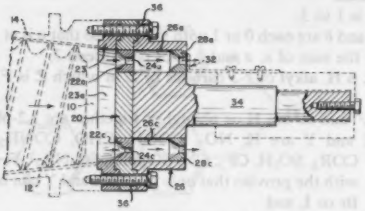
b is 1 or 2.

4,051,162

METHOD OF MAKING PUFFED DOUGH PIECES OF VARYING CONFIGURATION

Larry Edward Rose, Battle Creek, and Norman Francis Lawrence, Hickory Corners, both of Mich., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 429,305, Dec. 28, 1973, abandoned. This application June 30, 1975, Ser. No. 591,575
Int. Cl.[2] A23L *1/18*
U.S. Cl. 426—448 3 Claims



1. A method of making puffed dough pieces of varying configuration from one cooker-expander extrusion operation which produces gelantinized cereal dough comprising forcing cereal dough through a series of confined zones under high pressure and heat to an unconfined zone of lower pressure, said confined zones including a final extrusion zone and modulating backup zones, said extrusion zone having a plurality of restricted openings of varying cross-section and shape, said backup zones having a plurality of holding areas of varying size and configuration wherein the flow characteristics of said holding areas are correlated to the flow characteristics of the corresponding restricted openings in order to modulate the linear flow of the dough past the various restricted openings to the same rate, extruding said dough through said extrusion zone and modulating backup zones into said unconfined zone wherein the dough undergoes puffing, and subdividing the extruded dough into pieces.

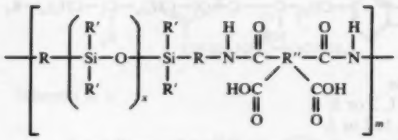
4,051,163

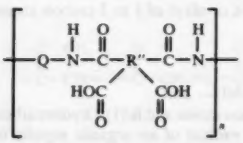
POLYIMIDE CONTAINING SILICONES

Abe Berger, 1504 Barclay Place, Schenectady, N.Y. 12309

Division of Ser. No. 597,971, July 21, 1975, Pat. No. 4,030,948. This application Mar. 18, 1977, Ser. No. 779,072
Int. Cl.[2] C07F *7/10*
U.S. Cl. 260—448.2 N 5 Claims

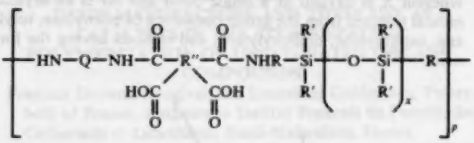
1. A reaction product of a tetracarboxylic acid dianhydride, an organic diamine and a di(aminoalkyl) polysiloxane which is a copolymer having recurring structural units of a block copolymer of the formulas :





and a random polymer of the formula:

-continued



wherein:

R is a divalent hydrocarbon radical;

R′ is a monovalent hydrocarbon radical;

R″ is a tetravalent organic radical;

Q is a divalent organic radical which is a residue of an organic diamine

x is an integer having a value of from 1 to 10;

m is an integer greater than 1, and

n is an integer greater than 1.

p is an integer greater than or equal to 0.

and the recurring units designated by *m*, *n*, and *p* are such that the mole percent of silicone diamine in the total polymer constitutes 18 to 45 mole percent of the total diamines in the copolymer.

4,051,164

ENOL ESTER OF α-DIKETONES

Jo-Fen Tung Kung, North Bergen, N.J., and Martin Franklin Epstein, Pearl River, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Division of Ser. No. 550,102, Feb. 14, 1975, abandoned, which is a division of Ser. No. 453,222, March 21, 1974, abandoned. This application Jan. 9, 1976, Ser. No. 647,952
Int. Cl.[2] C07F *7/18*
U.S. Cl. 260—448.8 R 2 Claims

2. The trimethylsilyl ether of the enol of pentane-2,3-dione.

4,051,165

PREPARATION OF BIURET POLYISOCYANATES

Kuno Wagner, Leverkusen, and Kurt Klinkmann, Hitdorf, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 17, 1970, Ser. No. 47,134
Claims priority, application Germany, June 19, 1969, 1931055
Int. Cl.[2] C07C *119/042*
U.S. Cl. 260—453 AB 10 Claims

1. A process for the preparation of biuret polyisocyanates which comprises reacting at a temperature of from about 60° C to about 210° C diisocyanates and up to about 0.4 mol per mol of diisocyanate of a tertiary alcohol selected from the group consisting of tertiary butyl alcohol, 2-methyl-2-butanol, 2-methyl-2-pentanol, 3-mehtyl-3-pentanol, 3-ethyl-3-pentanol, 1-methyl cyclo-pentanol, 1-methylcyclohexanol, 1-ethylcyclohexanol and 1,1-dimethylallyl alcohol in the presence of from about 0.001 to about 0.1 mol per mol of tertiary alcohol of a catalyst selected from the group consisting of hydrochlorides of ammonia and aliphatic, cycloaliphatic, araliphatic, aromatic and heterocyclic nitrogen containing bases wherein the nitrogen atoms of said bases are primary secondary or tertiary.

4,051,166

ARALIPHATIC DIISOCYANATES

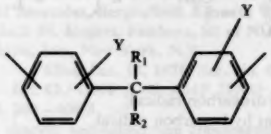
Reinhard H. Richter, North Haven; Benjamin W. Tucker, Bethany, and Henri Ulrich, Northford, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed June 8, 1976, Ser. No. 693,793
Int. Cl.[2] C07C *119/048*
U.S. Cl. 260—453 AR 9 Claims

1. An araliphatic diisocyanate having the formula

$$OCN(CH_2)_3OArX(CH_2)_3NCO$$

wherein X is oxygen or a single bond and Ar is an arylene radical selected from the group consisting of phenylene, tolylene, naphthylene, diphenylylene, and radicals having the formula



wherein R_1 and R_2 each represent a moiety selected from the class consisting of hydrogen and alkyl having from 1 to 4 carbon atoms inclusive, and Y is selected from the group consisting of hydrogen, alkyl from 1 to 4 carbon atoms, and alkoxy from 1 to 4 carbon atoms.

4,051,167

ALPHA HALO SUBSTITUTED PEROXYESTERS AND THEIR USE AS POLYMERIZATION INITIATORS

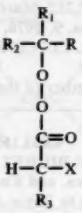
Roger N. Lewis, Martinez, Calif., assignor to Argus Chemical Corporation, Brooklyn, N.Y.

Continuation-in-part of Ser. No. 532,966, Dec. 16, 1974, abandoned. This application Dec. 19, 1975, Ser. No. 642,432

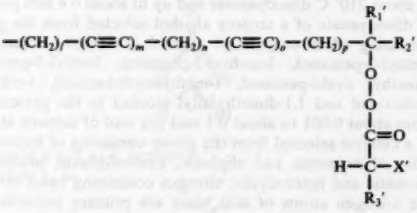
Int. Cl.² C07C *179/18;* **C08L** *67/06*

U.S. Cl. 260—453 RZ **16 Claims**

1. An organic peroxide of the formula:



wherein each of R_1 and R_2 are alkyl of up to about 7 carbon atoms, X is selected from bromine and chlorine, R_3 is alkyl of up to about 18 carbon atoms provided that R_3 is not methyl when R is alkyl, and R is selected from alkyl of up to about 7 carbon atoms and



in which *l, m, n, o,* and *p* are integers from 0–5 provided the sum of *l, m, n, o,* and *p* is at least 1, and R_1', R_2' and R_3' are each the same as R_1, R_2 and R_3, respectively.

4,051,168

FLUORINATION PROCESS

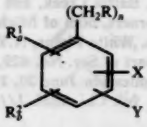
Andrew Edward Feiring, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 12, 1976, Ser. No. 685,805

Int. Cl.² C07C *143/24, 17/14*

U.S. Cl. 260—456 R **26 Claims**

1. The fluorination process which consists essentially in reacting under substantially anhydrous conditions one mode of an aromatic compound of the formula



wherein

n is 1 to 3;

a and *b* are each 0 or 1 with the proviso that *n* is at least 1 and the sum of *n, a* and *b* does not exceed 3;

R is H, alkyl of 1-3 carbons or Z in which Z is F, Cl, Br or I;

R^{21} and R^2 are H or phenyl or together are 1,2-phthaloyl;

X and Y are H, NO_2, COOH, CHO, $CONH_2$, $COOR^3$, COR_3, SO_3H, CF_3, CN, SO_2OR^3, $SO_2NR_2^3$, F, Cl, Br or I with the proviso that only one of X and Y can be H, F, Cl, Br or I; and

R^3 is alkyl of 1–4 carbons or phenyl;

with at least three moles of HF and at least one mole of a metal oxide selected from the group consisting of lead dioxide and nickel dioxide at a temperature range of about −30° to about +80° C for about 10 minutes to about 22 hours with the proviso that when nickel dioxide is used it is the last reactant added, and recovering an aromatic compound having a mono- or di-fluorinated benzylic carbon compound.

4,051,169

AMINO ACID ESTERS

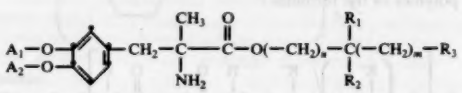
Walfred S. Saari, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 482,102, June 25, 1974, Pat. No. 3,983,138, which is a continuation-in-part of Ser. No. 400,609, Sept. 25, 1973, abandoned. This application Mar. 21, 1975, Ser. No. 560,834

Int. Cl.² C07C *101/77, 103/84, 153/07*

U.S. Cl. 560—40 **22 Claims**

1. A compound of the formula



wherein

n is 0, 1, 2 or 3;

m is 0, 1, 2 or 3;

A_1 and A_2 are individually H or a lower alkanoyl

P_1 and R_2 are individually H or alkyl of 1 to 3 carbon atoms and;

R_3 is the radical X—R_4

wherein

X is —O—, —S— or —NH— and

R_4 contains up to 21 carbon atoms and is (1) a hydrocarbon radical or (2) an acyl radical of an organic acyclic or non-heterocyclic, monocyclic carboxylic acid

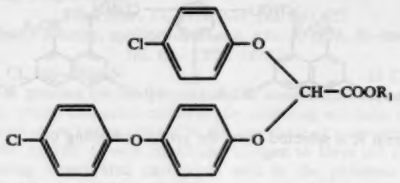
or a pharmaceutically acceptable acid addition salt thereof.

4,051,170
DIPHENOXYACETIC ACID DERIVATIVES

Erich Schacht; Werner Mehrhof; Zdenek Simane; Detlev Kayser, and Herbert Nowak, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Dec. 11, 1974, Ser. No. 531,475
Claims priority, application Germany, Dec. 15, 1973, 2362416
Int. Cl.[2] C07G *69/76*
U.S. Cl. 560—62 5 Claims

1. A compound of the formula



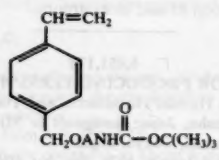
wherein R_1 is H or alkyl of 1–4 carbon atoms, or when R_1 is H, a physiologically acceptable salt thereof.

4,051,171
VINYLBENZYL ESTERS OF N-BOC-AMINO ACIDS

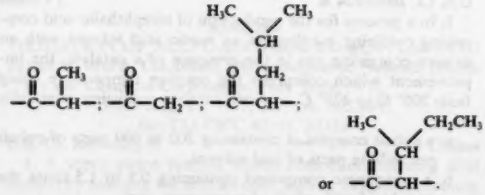
Nicholas D. Harris, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Feb. 20, 1976, Ser. No. 659,967
Int. Cl.[2] C07C *125/06*
U.S. Cl. 560—157 5 Claims

5. A compound of the formula:



wherein A is



4,051,172
MOLYBDENUM AND TUNGSTEN COMPOUNDS, THEIR MANUFACTURE AND THEIR USE AS CATALYSTS IN THE STEREOSPECIFIC POLYMERIZATION OF UNSATURATED ORGANIC COMPOUNDS

Francois Dawans, Bougival, and Emmanuel Goldenberg, Poissy, both of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil-Malmaison, France

Division of Ser. No. 429,209, Dec. 28, 1973, Pat. No. 3,931,242, which is a continuation-in-part of Ser. No. 215,425, Jan. 4, 1972, abandoned. This application Jan. 9, 1975, Ser. No. 539,825
Claims priority, application France, Jan. 18, 1971, 71.00583; Jan. 18, 1971, 71.00584
Int. Cl.[2] C07C *69/54*
U.S. Cl. 526—90 17 Claims

1. A process for polymerizing at least one monomer selected from the group consisting of straight-chain and cyclic ethylenic unsaturated organic compounds of 2 to 8 carbon atoms, comprising contacting, at a temperature of from − 20° to 100° C, said at least one monomer substantially in the liquid phase with a catalytic amount of at least one compound of the general formula $(H_{3-n}X_n)C\text{-}CO_2M(CO)_m(R)_p(L)_q$ in which each X is fluorine, bromine or chlorine with the provision that at least one X is fluorine, *n* is an integer selected from 1, 2 and 3, M is a metal selected from the group consisting of molybdenum and tungsten, R is selected from the group consisting of a hydride ion, or a methyl, ethyl, allyl, methallyl, crotyl, phenyl or benzyl radical, L is a Lewis base selected from the group consisting of aliphatic mono-, di- and tri-ethers, heterocyclic mono- and diethers, aliphatic monoether-monoalcohols, and aliphatic mono- and diketones, *m* is an integer from 1 to 3 inclusive, *p* is 1 and *q* is an integer selected from the values 1 to 2, with the proviso that the values of *m*, *p*, and *q* are such that, in the valence shell of said metal M, the sum of the number of electrons contributed by said metal M and the number of electrons contributed by the ligands is 18.

4,051,173
PHENOXYALKANOL DERIVATIVES

Erich Schacht; Werner Mehrhof; Zdenek Simane, and Herbert Nowak, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Continuation of Ser. No. 564,474, April 2, 1975, abandoned. This application June 9, 1976, Ser. No. 694,447
Claims priority, application Germany, Apr. 2, 1974, 2415867
Int. Cl.[2] C07C *69/06, 43/20*
U.S. Cl. 560—255 11 Claims

1. A compound selected from the group consisting of 2-[4-(4-chloro-phenoxy)-phenoxy]-propanol, 2-[4-(4-chlorophenoxymethyl)-phenoxy]-2-methyl-propanol, 2-[4-(4-chlorophenoxy)-phenoxy]-2-phenyl-propanol, 2-(4-biphenylyloxy)-2-phenyl-ethanol, 2-(4-biphenylyloxy)-2-phenyl-propanol, 2-(4'-chloro-4-biphenylyloxy)-2-phenyl-propanol, 2-(4-biphenylyloxy)-2-phenyl-ethyl acetate, 2-[4-(4-chlorophenoxy)-phenoxy]-propyl acetate, 2-[4-(4-fluorophenoxymethyl)-phenoxy]-2-methyl-propanol, and 2-[4-(4-chlorophenoxymethyl)-phenoxy]-propanol.

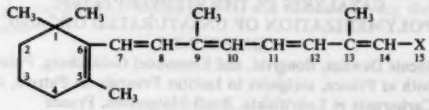
4,051,174
ISOMERIZATION PROCESS

Hansjorg Stoller, Reinach, and Hans Peter Wagner, Itingen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

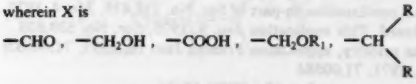
Filed Aug. 16, 1974, Ser. No. 498,161
Claims priority, application Switzerland, Aug. 21, 1973, 11994/73; July 3, 1974, 9101/74; July 18, 1974, 9879/74
Int. Cl.[2] C07C *67/00, 45/00, 41/00, 29/00*
U.S. Cl. 560—234 15 Claims

1. A process for geometrically isomerizing an isomeric com-

position selected from the group consisting of 9-cis and 11-cis isomers of a compound of the formula:



wherein X is



$-COOR_2$, $-CONHR_3$ or $-CON(R_3)_2$; R is lower alkoxy or the two R's taken together form lower alkylenedioxy; R_1 is alkanoyl or aroyl; R_2 is alkyl, aryl or aralkyl; and R_3 is hydroxy, alkyl, aryl or aralkyl; mixtures thereof, or mixtures thereof with the all trans isomer of said compound comprising contacting at a temperature of from 0° C to 250° C, said composition in an inert solvent medium with a palladium compound catalyst where the palladium compound is other than palladium phthalocyanin or other than a palladium compound containing a cyanide ion and producing a geometric isomeric mixture of said composition from which the all trans isomer can be separated therefrom in pure form by crystallization.

5. The process of claim 1, wherein the mixture contains from about 0% to about 15% by weight of 9-cis vitamin A acetate and from about 20% to about 40% by weight 11-cis vitamin A acetate and from about 40% to about 70% by weight all-tras vitamin A acetate based on the total weight of vitamin A acetate.

4,051,175

PHOSPHONOPHENYLAMINONAPHTHALENE COMPOUNDS

Herbert Francis Andrew; Cecil Vivian Stead, and Ronald Thompson, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

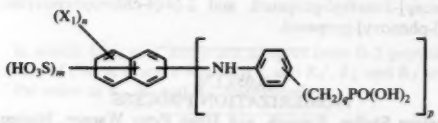
Filed Apr. 30, 1976, Ser. No. 682,047

Claims priority, application United Kingdom, May 16, 1975, 20848/75

Int. Cl.² C07F *9/38;* C09B *29/00*

U.S. Cl. 260—502.5 **5 Claims**

1. A naphthalene compound of the formula



wherein

m is 0, 1 or 2

n is 0 or can be 1 if *m* is 1 or 2 in which case X_1 is OH or NH_2 in *m* position to a SO_3H group,

p is 1 or 2,

q is 0 or 1 and

the benzene ring can be further substituted by OCH_3 or CH_3.

4,051,176

UREIDOPHENYLENEBIS(CARBONYLIMINO)DINAPHTHALENETRISULFONIC ACID COMPOUNDS

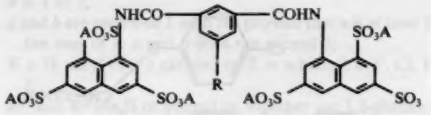
Seymour Bernstein, New City, N.Y.; Robert Herman Lenhard, Paramus, N.J., and Ransom Brown Conrow, Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 10, 1976, Ser. No. 684,690

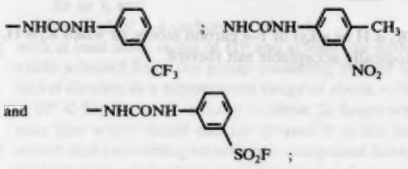
Int. Cl.² C07C *143/30;* A61K *31/185*

U.S. Cl. 260—506 **9 Claims**

1. A compound selected from those of the formula



wherein R is selected from the group consisting of



and A is hydrogen, alkali metal or alkaline earth metal, with the proviso that each A is identical in the same compound.

4,051,177

PROCESS FOR THE PREPARATION OF UNSATURATED AMINO COMPOUNDS

Rudolf Braden, Odenthal-Scheuren; Hans Knupfer, Schildgen, and Heinz Ziemann, Leichlingen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 12, 1974, Ser. No. 532,185

Claims priority, application Germany, Dec. 18, 1973, 2362780

Int. Cl.² C07C *143/56, 85/11, 101/46;* C07D *209/34*

U.S. Cl. 260—510 **6 Claims**

1. Process for the slective catalytic reduction of the nitro group of aromatic nitro compounds containing at least one non-aromatic C—C double or triple bond comprising hydrogenating said aromatic nitro compounds at 20° C to 140° C and at 5 to 150 bars of hydrogen pressure in the presence of a cobalt sulfide catalyst to produce the corresponding aromatic amino compounds which additionally still contain C—C multiple bonds by reduction of said nitro groups.

4,051,178

PROCESS FOR PRODUCING TEREPHTHALIC ACID

Tsuneo Kimura; Hiroshi Hashizume, and Yoshiaki Izumisawa, all of Kitakyushu, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed June 9, 1976, Ser. No. 694,361

Claims priority, application Japan, June 25, 1975, 50-79279

Int. Cl.² C07C *51/42*

U.S. Cl. 260—524 R **7 Claims**

1. In a process for the production of terephthalic acid comprising oxidizing p-xylene in an acetic acid solvent with an oxygen-containing gas in the presence of a catalyst, the improvement which comprises the reaction temperature being from 205° C to 225° C, and said catalyst consisting essentially of

a. a cobalt compound containing 200 to 600 parts of cobalt per million parts of said solvent,

b. a manganese compound containing 0.5 to 1.5 times the weight of said cobalt of manganese, and

c. a bromine compound taken from the class consisting of hydrogen bromide, manganese bromide, and cobalt bromide, said bromine compound comprising 400 to 2000 parts of bromine per million parts of said solvent.

4,051,179

CATALYTIC PROCESS FOR THE PREPARATION OF UNSATURATED CARBOXYLIC ACID

Hiroshi Sonobe, Otake; Masaaki Kato, Yamaguchi; Hideo Matsuzawa, Otake; Hiromichi Ishii, Otake, and Masao Kobayashi, Otake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1976, Ser. No. 667,677
Claims priority, application Japan, Apr. 3, 1975, 50-40660
Int. Cl.[2] C07C *51/32*
U.S. Cl. 260—530 N **10 Claims**

1. A process for the preparation of unsaturated carboxylic acids, which comprises catalytically oxidizing acrolein, methacrolein or mixtures thereof in the gas phase at a temperature of 240° to 390° C with molecular oxygen to form the corresponding unsaturated carboxylic acid in the presence of a catalyst having the composition

$$P_a Mo_b As_c X_d Y_e Z_f O_g$$

wherein *a*, *b*, *c*, *d*, *e*, *f* and *g* represent the atomic ratios of each component and *a* is within the range of 0.03 to 0.2, *b* is 1, *c* is within the range of 0.015 to 0.15, *d* is within the range of 0.003 to 1, *e* is within the range of 0.003 to 0.417, *f* is within the range of 0.003 to 1, and *g* is a value determined by the degree of oxidation of the elements present in the catalyst, and wherein X is copper, vanadium, or a mixture thereof, Y is at least one alkali metal selected from the group consisting of lithium, sodium, potassium rubidium and cesium, and Z is at least one metal selected from the group consisting of magnesium, aluminum, calcium, titanium, zirconium, silver, antimony, tellurium, barium, tantalum and silicon.

4,051,180

PREPARATION OF ACRYLIC ACID AND METHACRYLIC ACID

Wilfrid G. Shaw, Lyndhurst, and David B. Terrill, Bedford Heights, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jan. 2, 1976, Ser. No. 646,224
Int. Cl.[2] C07C *51/32*
U.S. Cl. 260—530 N **4 Claims**

1. The process for the production of acrylic acid or methacrylic acid by the oxidation of acrolein or methacrolein, respectively, in the vapor phase with molecular oxygen in the presence of steam, at a temperature of about 200° to about 500° C employing a catalyst having the empirical formula:

$$Mo_a V_b Cu_c X_d O_e$$

wherein X in the formula is an element selected from the group consisting of antimony and the combination of antimony and germanium, and wherein

a is a number from 6 to about 18;
b, *c* and *d* each are about 0.1 to about 6; and
e is the number of oxygens required to satisfy the valence requirements of the other elements present.

4,051,181

OXIDATION OF ALLYL ALCOHOL TO ACRYLIC ACID

Jawad H. Murib, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Aug. 11, 1975, Ser. No. 603,907
Int. Cl.[2] C07C *45/16*, *51/32*
U.S. Cl. 260—531 R **8 Claims**

1. A vapor phase process which comprises oxidizing allyl alcohol by reacting the allyl alcohol with an oxygen containing gas in the presence of a supported two-metal catalyst at a temperature of 125°–320° C., wherein one metal is palladium and the second metal is copper or silver, and recovering a gaseous reaction product mixture containing acrolein and acrylic acid.

4,051,182

PROCESS FOR THE MANUFACTURE OF α-CHLOROPROPIONYL CHLORIDE

Harold M. Pitt, Lafayette, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Apr. 12, 1976, Ser. No. 676,022
Int. Cl.[2] C07C *51/58*
U.S. Cl. 260—544 Y **24 Claims**

1. A process for the manufacture of α-chloropropionyl chloride comprising the steps of

a. reacting 1,2-dichloropropane in the liquid phase at a temperature in the range of from about 25° C to 90° C with gaseous chlorine in the presence of a catalyst selected from the group consisting of ferric chloride, aluminum chloride, iodine, sulfur, iron, iron in the presence of ultraviolet light and mixtures thereof, to form 1,1,2-trichloropropane, and separating the product 1,1,2-trichloropropane;
b. reacting the 1,1,2-trichloropropane of step (a) with a base selected from aqueous or alcohol solutions of sodium and/or potassium hydroxides, alkaline earth metal hydroxides and sodium carbonate in the liquid phase or in the gaseous phase in the presence of a hydrogen chloride removing catalyst at a temperature in the range of from about 60° C to 110° C, and separating the product 1,1-dichloropropene-1; and
c. reacting the 1,1-dichloropropene-1 of step (b) in the liquid phase at a temperature in the range of from about 24° C to about 100° C with oxygen in the presence of chlorine or bromine and an activating agent for the chlorine or bromine and further in the presence of a lower alkyl-primary- or -secondary-amide and recovering the produced α-chloropropionyl chloride.

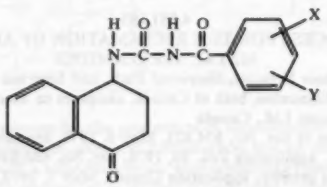
4,051,183

1-BENZOYL-3-(1,2,3,4-TETRAHYDRO-4-OXO-1-NAPHTHYL)-UREA, A NOVEL AND USEFUL INTERMEDIATE FOR THE PREPARATION OF ANIMAL GROWTH PROMOTING AGENTS

Goro Asato, Titusville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

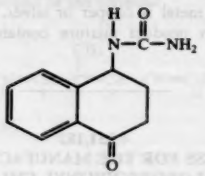
Filed Sept. 2, 1976, Ser. No. 720,164
Int. Cl.[2] C07C *127/19*, *127/22*; A61K *31/17*
U.S. Cl. 260—553 A **6 Claims**

1. A compound of the formula:

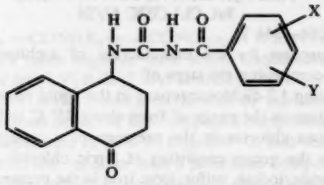


wherein X is selected from the group consisting of hydrogen, methyl, methoxy, chloro and nitro; Y is selected from the group consisting of hydrogen, chloro and nitro; and the racemic mixture and the optical isomers thereof.

5. A process for the preparation of a compound, racemic mixture and optical isomers thereof, of the formula:



which comprises hydrolyzing a compound of the formula:



wherein X is selected from the group consisting of hydrogen, methyl, methoxy, chloro and nitro; Y is selected from the group of consisting of hydrogen, chloro and nitro; and the racemic mixture and the optical isomers thereof.

4,051,184

N-(1,1 SUBSTITUTED PROPYNYL)-α-(3,5-SUBSTITUTED PHENOXY) ALKYL AMIDES AND THEIR USE AS HERBICIDES

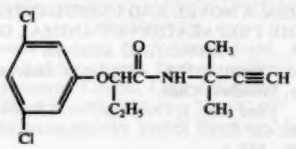
Duane R. Arneklev, Sunnyvale; Don R. Baker, Orinda, and Francis H. Walker, Mill Valley, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 464,715, April 26, 1975, abandoned, which is a continuation of Ser. No. 353,871, April 23, 1973, abandoned, which is a continuation of Ser. No. 157,058, June 25, 1971, abandoned. This application Sept. 29, 1975, Ser. No. 617,454

Int. Cl.² C07C *103/178*

U.S. Cl. 260—559 B **2 Claims**

1. The compound N-(1,1-dimethyl propargyl-α-(3,5-dichlorphenoxy) butyramide having the structural formula



4,051,185

PROCESS FOR THE RECLAMATION OF ALKALI METAL ALKYLAMIDES

John Fraser Prescott, Sherwood Park, and Emerson Cecil Sanford, Edmonton, both of Canada, assignors to Atomic Energy of Canada Ltd., Canada

Division of Ser. No. 574,421, May 5, 1975, abandoned. This application Feb. 10, 1976, Ser. No. 656,839

Claims priority, application Canada, May 7, 1975, 199202

Int. Cl.² C07C *102/00*

U.S. Cl. 260—561 R **17 Claims**

1. A process for reclaiming alkali metal alkylamide systems in purified form which comprises:

adding ammonia to a solution in a primary alkylamine of an alkali metal alkylamide together with impurities, including N,N'-dialkylformamidine, and allowing reaction between the ammonia and said alkali metal alkylamide to occur;

separating the alkali metal amide so obtained from the solution; and

reacting said alkali metal amide with a primary alkylamine under conditions where NH_3 is removed to form alkali metal alkylamide free from said impurities.

4,051,186

AMINO-PROPRANOLOL

Nathan O. Kaplan, La Jolla, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Division of Ser. No. 523,618, Nov. 13, 1974, abandoned, and a continuation-in-part of Ser. No. 481,282, June 20, 1974, Pat. No. 3,950,422. This application Jan. 28, 1976, Ser. No. 652,951

Int. Cl.² C07C *93/06*

U.S. Cl. 260—570.7 **1 Claim**

1. Amino-propranolol.

4,051,187

METHOD OF PRODUCING AMINOPHENOL USING A RHODIUM/CARBON CATALYST WITH SYNERGISTIC QUANTITIES OF RHODIUM, TRICHLORIDE OR RHODIUM TRIBROMIDE

Eugene Medcalf, Sommerville, N.J., assignor to Oxamine, Inc., Mount Vernon, N.Y.

Continuation-in-part of Ser. No. 555,428, March 5, 1975, abandoned. This application Apr. 26, 1976, Ser. No. 680,174

Int. Cl.² C07C *91/44*

U.S. Cl. 260—575 **4 Claims**

1. A method of preparing aminophenol comprising the steps of:

a. hydrogenating a nitrobenzene substantially to completion by feeding hydrogen to a reaction mixture containing the nitrobenzene in the presence of aqueous sulfuric acid and a hydrogenation catalyst which comprises platinum group metal wherein from 10 to 80% of said platinum group metal is in the form of a rhodium salt selected from the group which consists of $RhCl_3$ and $RhBr_3$ and from 20 to 90% of said platinum group metal is in the form of elemental Rh, Pt, Pd or Ru and wherein the balance of said catalyst comprises carbon to produce a para-aminophenol in an aqueous phase containing the latter at a temperature of from 80 to 110° C and at 1 to 3 atmospheres;

b. terminating hydrogen feed to said reaction mixture:

c. thereafter charging the reaction mixture with a quantity of fresh nitrobenzene as required to repeat step (a);

d. thereafter premitting said aqueous phase to separate from the nitrobenzene phase;

e. next removing said aqueous phase from said reactor while retaining said nitrobenzene phase and said catalyst therein;

f. thereafter adding fresh sulfuric acid to the reactor;

g. repeating steps (a) through (f) in succession to transform nitrobenzene semicontinuously into said para-aminophenol; and

h. recovering the para-aminophenol thus formed from the aqueous phases removed from said reactor.

4,051,188

NOVEL BICYCLOALKANE DERIVATIVES AND THE PRODUCTION THEREOF

Gerhard Sauer, Berlin; Helmut Häuser, Unna; Gregor Haffer, Berlin; Juergen Ruppert, Berlin; Ulrich Eder, Berlin, and Rudolf Wiechert, Berlin, all of Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

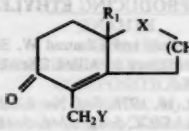
Continuation-in-part of Ser. No. 317,549, Dec. 22, 1972, Pat. No. 4,008,253. This application Dec. 27, 1976, Ser. No. 753,997

Claims priority, application Germany, Dec. 24, 1971, 2165320; Apr. 29, 1972, 2221704; Nov. 2, 1972, 2254175

Int. Cl.² C07C *49/76*

U.S. Cl. 260—590 FA **14 Claims**

1. A bicycloalkane of the formula



wherein n is 1 or 2, R_1 is alkyl of 1–4 carbon atoms, X is carbonyl, hydroxymethylene, or hydroxymethylene etherified with alkyl, carbocyclic aryl or carbocyclic aralkyl of up to 10 carbon atoms; and Y is —S—R_2, —SO_m—R_2, or

wherein m is 1 or 2, R_2 is aryl or aralkyl of up to 12 carbon atoms, R_3 is hydrogen or alkyl of 1–4 carbon atoms, R_4 is phenyl or phenyl substituted by alkoxy of 1–4 carbon atoms or benzyloxy, and Z is nitro, alkanoyl of 2–4 carbon atoms, alkylsulfinyl of 1–4 carbon atoms or alkylsulfonyl of 1–4 carbon atoms.

4,051,189

CYCLIC ETHERS OF PHENOLIC COMPOUNDS AND POLYMERS THEREOF

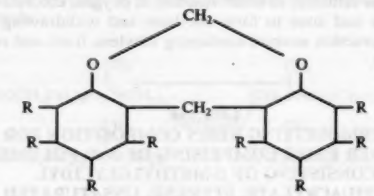
Alvin F. Shepard, and Bobby F. Dannels, both of Grand Island, N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation of Ser. No. 570,545, April 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 450,945, March 13, 1974, abandoned. This application Aug. 4, 1976, Ser. No. 711,651

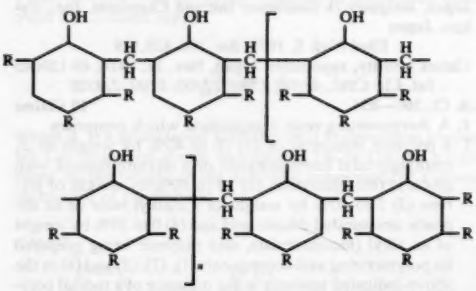
Int. Cl.² C07C *37/00, 39/16*

U.S. Cl. 260—619 A **3 Claims**

1. The method of preparing a polymer by reaction of the monomer



in the presence of a polymerization catalyst selected from the group consisting of BF_3, BCl_3 or PF_5 to form



wherein R in both formulas is independently selected from the group of hydrogen, chlorine, bromine and fluorine and n is at least 5.

4,051,190

MANUFACTURE OF 3-ARYLPROPYL CHLORIDE

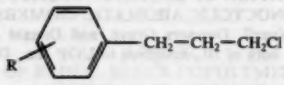
Daniel Ambrose Dunnigan, Winthrop Harbor, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Jan. 30, 1976, Ser. No. 653,809

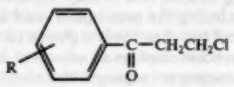
Int. Cl.² C07C *25/14*

U.S. Cl. 260—651 R **9 Claims**

1. A two-step process for the preparation of an arylpropyl chloride of the formula



wherein R is hydrogen, loweralkyl or halogen, consisting essentially in hydrogenating a solution of an arylpropiophenone of the formula



in an inert solvent in the presence of a catalyst containing metallic ruthenium on a suitable inert support at a temperature between 10° C and 100° C and at a hydrogen pressure between 1 and 100 atm. until an equimolar amount of gaseous hydrogen is used and, after removing said catalyst from said solution, hydrogenating the mixture in the presence of a mineral acid and a catalyst containing metallic palladium on a suitable solid support at a temperature between 10° C and 100° C and at a hydrogen pressure between 1 and 100 atm. until a second equimolar amount of the gaseous hydrogen has been used.

4,051,191

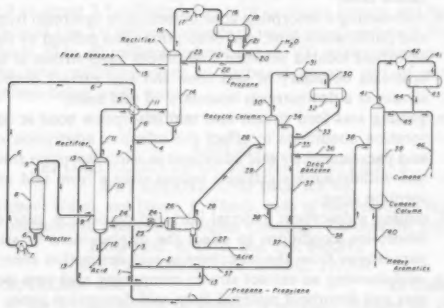
SOLID PHOSPHORIC ACID CATALYZED ALKYLATION OF AROMATIC HYDROCARBONS

Dennis J. Ward, South Barrington, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jan. 3, 1977, Ser. No. 756,523

Int. Cl.² C07C *3/54*

U.S. Cl. 260—671 R **2 Claims**



1. In the process for the production of alkylaromatic hydrocarbons wherein an aromatic hydrocarbon and an olefin are contacted with a solid phosphoric acid-containing catalyst in a reaction zone maintained at alkylation-promoting conditions; a reaction zone effluent stream comprising the aromatic hydrocarbon and an alkylaromatic hydrocarbon are passed into a first fractionation zone; a bottoms stream comprising the aromatic hydrocarbon and the alkylaromatic is removed from the first fractionation zone at a first temperature and then passed into a second fractionation zone at a lower pressure and at a

lower second temperature; the improvement which comprises flashing the bottoms stream at an intermediate point between the first fractionation zone and the second fractionation zone and then passing the bottoms stream into a settling vessel and removing released phosphoric acid from the settling vessel to thereby reduce the amount of phosphoric acid which enters the second fractionation zone.

4,051,192

SEPARATION OF BI-ALKYL SUBSTITUTED MONOCYCLIC AROMATIC ISOMERS

Richard W. Neuzil, Downers Grove, and Donald J. Korous, Bensenville, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 136,199, April 21, 1971. This application Nov. 11, 1976, Ser. No. 740,892

Int. Cl.[2] C07C *7/13*

U.S. Cl. 260—674 SA **16 Claims**

1. A process for separating the para-isomer from a feed stream comprising at least two bi-alkyl monosubstituted aromatic isomers, including the para-isomer, said isomers having more than eight and less than about eighteen carbon atoms per molecule which process employs an adsorbent comprising a X or a Y zeolite containing at exchangeable cationic sites a cation pair selected from the group consisting of barium and potassium, potassium and beryllium, potassium and magnesium, rubidium and barium, cesium and barium, potassium and rubidium and potassium and cesium and which process comprises the steps of:

a. maintaining net fluid flow through a column of said adsorbent in a single direction, which column contains at least three zones having separate operational functions occurring therein and being serially interconnected with terminal zones of said column connected to provide a continuous connection of said zones;

b. maintaining an adsorption zone in said column, said zone defined by the adsorbent located between a feed input stream at an upstream boundary of said zone and a raffinate output stream at a downstream boundary of said zone;

c. maintaining a purification zone immediately upstream from said adsorption zone, said purification zone defined by the adsorbent located between an extract output stream at an upstream boundary of said purification zone and said feed input stream at a downstream boundary of said purification zone;

d. maintaining a desorption zone immediately upstream from said purification zone, said desorption zone defined by the adsorbent located between a desorbent input stream at an upstream boundary of said zone and said extract output stream at a downstream boundary of said zone;

e. passing said feed stream into said adsorption zone at adsorption conditions to effect the selective adsorption of said para-isomer by said adsorbent in said adsorption zone and withdrawing a raffinate output stream from said adsorption zone;

f. passing a desorbent material into said desorption zone at desorption conditions to effect the displacement of said para-isomer from the adsorbent in said desorption zone;

g. withdrawing an extract stream comprising said para-isomer and desorbent material from said desorption zone;

h. passing at least a portion of said extract output stream to a separation means and therein separating at separation conditions at least a portion of said desorbent material to produce a para-isomer product; and

i. periodically advancing through said column of adsorbent in a downstream direction with respect to fluid flow in said adsorption zone the feed input stream, raffinate output stream, desorbent input stream, and extract output stream to effect the shifting of zones through said adsorbent and the production of extract output and raffinate output streams.

4,051,193

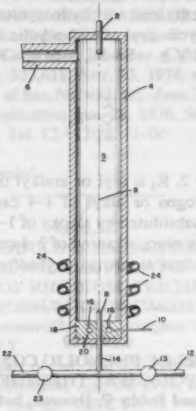
PROCESS FOR PRODUCING ETHYLENE FROM ETHANE

Bruce E. Kurtz, Marcellus, and Edmund W. Smalley, Brewerton, both of N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Oct. 14, 1975, Ser. No. 622,326

Int. Cl.[2] C07C *5/42, 5/44, 5/48*

U.S. Cl. 260—683.3 **10 Claims**



1. A process for the production of ethylene by the oxidative dehydrogenation of ethane which comprises introducing, under pressure via a gas jet a first gas feed stream containing oxygen and chlorine into an elongated reaction zone internally disposed within an elongated housing; introducing a second gas feed stream containing ethane into said reaction zone as an annulus surrounding said first gas feed stream and flowing co-currently therewith; maintaining said reaction zone under conditions sufficient to effect reaction of oxygen, chlorine and ethane in said zone to form ethylene; and withdrawing the product reaction mixture containing ethylene from said reaction zone.

4,051,194

THERMOSETTING RESIN COMPOSITION FOR POWDER PAINT COMPRISING OF A (I) POLYMER CONSISTING OF β-METHYLGLYCIDYL (METH)ACRYLATE, STYRENE, UNSATURATED DIALKYL ESTER, ALKYLACRYLATE AND (II) SATURATED ALIPHATIC DIBASIC ACID

Noboru Ishikawa, Sakai; Hidehisa Nakamura, Osaka; Kazuyoshi Maruyama, Izumiohtsu, and Akio Shoji, Sennan, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Nov. 5, 1975, Ser. No. 629,129

Claims priority, application Japan, Nov. 11, 1974, 49-129045

Int. Cl.[2] C08L *63/00*; C08F *22/00, 8/00, 224/00*

U.S. Cl. 260—836 **10 Claims**

1. A thermosetting resin composition which comprises

I. a polymer consisting of (1) 10 to 40% by weight of β-methylglycidyl (meth)acrylate or a mixture thereof with glycidyl (meth)acrylate, (2) 20 to 80% by weight of styrene (3) 3 to 40% by weight of a dialkyl ester of an aliphatic unsaturated dibasic acid and (4) 0 to 30% by weight of an alkyl (meth)acrylate, said polymer being prepared by polymerizing said components (1), (2), (3) and (4) in the above-indicated amounts in the presence of a radical polymerization catalyst, said polymer having a softening point of 80° to 150° C as measured by the ring-and-ball method, and a number average molecular weight of 3,000 to 15,000 as measured by osmometry, and

II. an aliphatic saturated dibasic acid.

4,051,195

POLYEPOXIDE-POLYACRYLATE ESTER COMPOSITIONS

Wayne F. McWhorter, Louisville, Ky., assignor to Celanese Polymer Specialties Company, Louisville, Ky.

Filed Dec. 15, 1975, Ser. No. 640,674
Int. Cl.² C08L *63/00*
U.S. Cl. 260—837 R **9 Claims**

1. A curable composition which comprises: (1) a blend of an epoxide resin containing more than one 1,2-epoxy group per molecule and a polyacrylate or polymethacrylate ester of a polyol wherein said ester contains more than one terminal acrylate or methacrylate group, the epoxide resin and the ester being present in the weight ratio of about 100 parts of epoxide resin to about 5 to about 100 parts of ester; and (2) an aliphatic polyamine curing agent containing at least 3 amine hydrogen atoms per molecule in the amount of about 0.75 to about 1.25 amine hydrogen atoms for each epoxy group of the epoxide resin and for each acrylic unsaturated group of the polyacrylate or polymethacrylate ester said amine atoms reacting with the epoxide ring and adding across the double bond of the acrylate group of the composition.

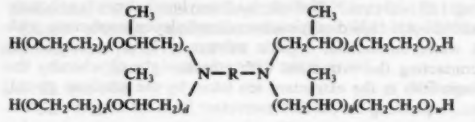
4,051,196

ANTISTATIC FIBER CONTAINING CHAIN-EXTENDED TETROLS BASED ON DIAMINES

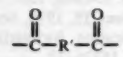
Rodney Lee Wells, and Lamberto Crescentini, both of Chester, Va., assignors to Allied Chemical Corporation, Morris Township, N.J.

Continuation of Ser. No. 581,194, May 27, 1975, abandoned.
This application Aug. 4, 1976, Ser. No. 711,764
Int. Cl.² C08L *77/00*
U.S. Cl. 260—857 PG **5 Claims**

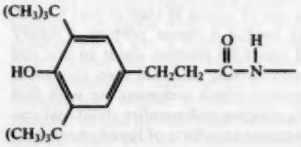
1. An antistatic polyamide fiber having less than 4×10^3 nubs per pound of fiber, said fiber containing about 1% to 12% by weight of an antistatic compound which is a chain-extended reaction product of a tetrol compound represented by the formula:



where *a, b, c, d, w, x, y* and *z* are each a whole number and R is a difunctional radical from a hydrocarbon containing 1 to 13 carbon atoms, said tetrol compound having a molecular weight between about 4,000 and about 50,000, and at least one compound selected from the group consisting of compounds which yield the divalent radical



where R′ is a difunctional radical from a hydrocarbon containing 1 to 30 carbon atoms; and about 0.5% to 12% by weight, based on the weight of the antistatic compound, of a phenol compound of the formula



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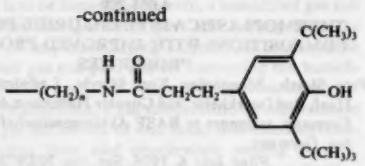


where *n* is 2 to 6.

4,051,197

BLEND OF RADIAL BLOCK COPOLYMERS HAVING HIGH IMPACT STRENGTH

Lawrence M. Fodor, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 10, 1975, Ser. No. 630,607
Int. Cl.² C08L *53/02*
U.S. Cl. 260—876 B **9 Claims**

1. A composition comprising a blend of at least two separately prepared resinous radial block copolymers of a monovinyl-substituted aromatic compound and a conjugated diene, each of said copolymers having a heterogeneity index of polymerized monovinyl-substituted aromatic compound blocks outside the range of 2.8 to 3.5, said blend having a heterogeneity index of polymerized monovinyl-substituted aromatic compound blocks within the range of about 2.8 to 3.5.

4,051,198

MODIFIED WATER-DILUTABLE POLYMER OIL IMIDES CONTAINING CARBOXYL GROUPS

Hans-Peter Patzschke, Wuppertal, Germany, assignor to Dr. Kurt Herberts & Co. Gesellschaft mit Beschrankter Haftung Vorm. Otto Louis Herberts, Wuppertal, Germany

Filed Dec. 1, 1975, Ser. No. 636,368
Int. Cl.² C08F *8/30*
U.S. Cl. 260—879 **4 Claims**

1. A modified, water-dilutable olefin polymer oil imide resin wherein the olefin polymer oil portion has a molecular weight of from about 500 to 2500 and comprises at least 50% by weight of 1,4-cis-polybutadiene oil, and wherein the imide resin has a viscosity of from about 300 to 1500 m Pas as measured on a 50% solution (weight/weight) in butyl glycol at 25° C. and the imide resin contains, per gram of resin, from about 2.0 to about 3.5 milliequivalents of carboxyl groups and from about 0.3 to 2.0 milliequivalents of imide groups wherein from about 10 to 40 milliequivalents out of 100 milliequivalents of the total milliequivalents of carboxyl groups and of imide groups being imide groups.

4,051,199

EPOXIDIZED COPOLYMERS OF STYRENE, BUTADIENE AND ISOPRENE

Kishore Udipi, and Henry L. Hsieh, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 4, 1976, Ser. No. 663,892
Int. Cl.² C08F *257/02, 279/02, 297/04*
U.S. Cl. 260—880 R **12 Claims**

1. As a composition of matter, a polymer defined by the formula

S-D/S-S

in which S is a polystyrene block, D/S is a tapered copolymer block of styrene and an alkadiene selected from the group consisting of butadiene and isoprene having an alkadiene-rich end and a styrene-rich end of which the styrene-rich end is attached to one block S, with the further provision that 5–95% olefinic unsaturations in the D/S blocks have been removed by epoxidation.

4,051,200

THERMOPLASTIC VINYL CHLORIDE POLYMER COMPOSITIONS WITH IMPROVED PROCESSING PROPERTIES

Petr Simak, Mannheim; Karl Herrle, Ludwigshafen; Franz Haaf, Bad Duerkheim, and Guenter Hatzmann, St. Ilgen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed July 6, 1976, Ser. No. 702,973

Claims priority, application Germany, July 12, 1975, 2531198

Int. Cl.² C08L *27/06*

U.S. Cl. 260—899 **9 Claims**

1. A thermoplastic composition comprising a mixture of

A. from 99.9 to 80 parts by weight of a homopolymer of vinyl chloride or a copolymer of vinyl chloride with up to 30 percent by weight of one or more other monomers copolymerizable with vinyl chloride, and

B. from 0.1 to 20 parts by weight of a copolymer of an acrylic acid ester or a methacrylic acid ester, which copolymer contains

B1. from 99.9 to 60 percent by weight of copolymerized units of an acrylic acid alkyl ester or methacrylic acid alkyl ester of 2 to 6 carbon atoms in the alcohol component,

B2. from 0.1 to 30 percent by weight of units which contain a lactone ring structure and

B3. from 0 to 39.9 percent by weight of units of one or more other copolymerizable monomers, the percentages being based on the above copolymer B.

4,051,201

THIOBISPHENOL ESTERS OF PENTAVALENT PHOSPHORUS ACIDS

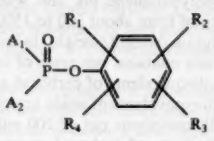
Edward D. Weil, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 26,060, April 6, 1970, abandoned. This application July 23, 1975, Ser. No. 598,297

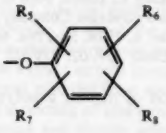
Int. Cl.² C07F *9/09*; C10M *1/48*

U.S. Cl. 260—930 **12 Claims**

1. A process for the preparation of polymeric phosphorus acid esters comprising: reacting an aryl ester of a pentavalent phosphorus acid of the formula:



with a sulfur compound of the formula S_nY_2, in a ratio of less than or equal to about 1.5:1 wherein A_1 and A_2 are independently selected from the group consisting of alkyl, alkoxy, aryl, alkaryl, haloaryl, arylalkyl, alkoxyaryl, alkaryloxy, aryloxy, hydroxy, chlorine, bromine and



each of said alkyl, alkoxy, aryl, alkaryl, haloaryl, arylalkyl, alkoxyaryl, alkaryloxy, and aryloxy groups having from 1 to 20 carbon atoms; R_1, R_2, R_3, R_4, R_5, R_6, R_7, and R_8 are independently selected from the group consisting of hydrogen, alkyl, alkoxy, aryl, alkaryl, haloaryl, arylalkyl, aryloxy, and halogen; each of said alkyl, alkoxy, aryl, alkaryl, haloaryl, arylalkyl, and aryloxy groups having from 1 to 20 carbon atoms, Y is a halogen of atomic weight between 33 and about 84 and n is an integer having a value of from 1 to about 6 inclusive; said reaction being conducted in the presence of a Friedel-Crafts catalyst.

4,051,202

METHOD FOR SEPARATING MONO- AND DI-OCTYLPHENYL PHOSPHORIC ACID ESTERS

Wesley D. Arnold, Jr., Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 17, 1975, Ser. No. 632,749

Int. Cl.² C07F *9/09*

U.S. Cl. 260—990 **4 Claims**

1. A method of separating a mono-octylphenyl phosphoric acid ester from a mixture containing mono- and di-octylphenyl phosphoric acid esters, said method comprising:

a. contacting said mixture with an organic solvent selected from the group consisting of methanol, ethanol, n-propanol, isopropanol, n-butanol, 2-butanol, and tert-butanol;

b. contacting said mixture with a source of ions of an alkali metal selected from the group consisting of sodium and lithium to cause alkali metal mono-octylphenyl phosphate salt to be distributed in a solid phase;

c. separating the resulting alkali metal mono-octylphenyl phosphate salt in said solid phase from said organic solvent; and

d. acidifying the separated mono-octylphenyl phosphate salt to form the mono-octylphenyl phosphoric acid ester.

4,051,203

METHOD FOR PURIFYING BIDENTATE ORGANOPHOSPHORUS COMPOUNDS

Wallace W. Schulz, Richland, Wash., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 8, 1976, Ser. No. 703,325

Int. Cl.² C07F *9/32*

U.S. Cl. 260—990 **6 Claims**

1. A method for removing acidic impurities present in bidentate organophosphorus compounds comprising: diluting the organophosphorus compound selected from the group consisting of dihexyl-N,N-diethylcarbamylmethylenephosphonate and dibutyl-N,N-diethylcarbamylmethylenephosphonate with a water immiscible, organic solvent to form an extractant, contacting the extractant with ethylene glycol whereby the impurities in the extractant are taken by the ethylene glycol, and separating the purified extractant from the ethylene glycol.

4,051,204

APPARATUS FOR MIXING A LIQUID PHASE AND A GASEOUS PHASE

Hans Muller, Zurich, and Konstantin Sotirianos, Stafa, both of Switzerland, assignors to Hans Muller, Mannedorf, Switzerland

Continuation of Ser. No. 534,898, Dec. 20, 1974, abandoned. This application June 11, 1976, Ser. No. 694,943

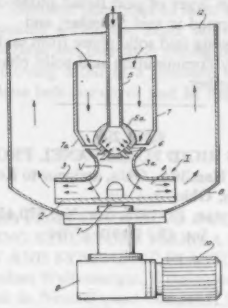
Claims priority, application Switzerland, Dec. 21, 1973, 18125/73; Dec. 21, 1973, 18126/73

Int. Cl.² B01F *3/04*

U.S. Cl. 261—36 R **5 Claims**

1. In an apparatus for mixing a liquid phase and a gaseous phase, particularly a fermentor for biologically growing microorganisms, a combination comprising a vessel adapted to contain a liquid phase; a tubular guide baffle in said vessel and having spaced open ends one of which at least in part bounds a venturi-shaped passage having a throat portion; a rotary impeller mounted in said vessel for rotation about an axis and having an axial inlet communicating with said open end, and a plurality of peripheral outlets which communicate with said axial inlet; drive means for rotating said impeller about said axis so that centrifugal action causes expulsion of liquid phase from

said outlets and creates suction in said venturi-shaped passage to thereby draw additional liquid phase from said guide baffle into said inlet; and gas admitting means including a conduit which communicates with a source of gaseous phase, and a plurality of tubular nipples each having an elongated tubular end portion which extends into said throat portion in direction generally transverse to the axial flow of liquid phase, each tubular end portion terminating in a bevelled discharge port which is inclined at a substantially constant angle of inclination



relative to the elongation of the respective tubular end portion and which faces generally downstream of the axial flow of liquid phase, said discharge ports communicating with different locations of said passage so that the suction in said throat portion of said passage draws said gaseous phase from said source via said conduit and ejects said gaseous phase out of said discharge ports of said nipples across different transverse sections of said throat portion without requiring said gaseous phase to be in pressurized condition.

4,051,205

APPARATUS FOR SATURATED GAS DELIVERY

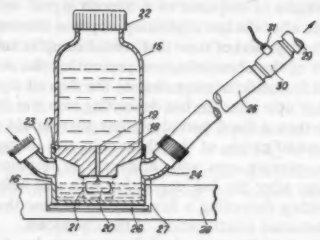
Graham Cameron Grant, 16149 Campbell Parade, Manly Vale 2093, Sydney, New South Wales, Australia

Continuation-in-part of Ser. No. 396,032, Sept. 10, 1973, abandoned. This application Sept. 10, 1975, Ser. No. 612,149

Claims priority, application Australia, Sept. 13, 1972, 0427/72; Nov. 17, 1972, 1267/72

Int. Cl.[2] A61M *15/00*; B01F *15/06*

U.S. Cl. 261—70 **9 Claims**



1. Humidifying apparatus comprising a reservoir chamber, a float chamber located beneath said reservoir chamber, a valve between said reservoir and float chambers, a float in said float chamber operatively controlling said valve whereby liquid is admitted from said reservoir chamber to said float chamber to maintain the liquid level therein sensibly constant when the apparatus is in use, a humidifying chamber surrounding said float chamber and which contains liquid vapour, means permitting equalizing of liquid levels in said float chamber and said humidifying chamber by allowing liquid flow from the float chamber to said humidifying chamber, a gas entry port leading into the upper portion of said humidifying chamber for admitting gas which is to be humidified thereto, a humidified gas exit port remote from said gas entry port and leading from the upper portion of said humidifying chamber, a flexible hose leading from said gas exit port and for conveying the humidified gas therefrom to a point of use, a heating element extending along said flexible hose, a gas temperature sensing element located at the gas outlet end of said hose, first electrical connections extending from said temperature sensing element, second electrical connections extending from said heating element, a temperature sensor in said humidifying chamber, third electrical connections extending from said sensor, a stand, a heater in said stand for heating said humidifying chamber, control circuitry having inputs receiving the first, second and third connections respectively and controlling operation of the hose heating element and said heater, independently operating closed loop control circuits of which the first automatically controls the hose heating element in response to the output of the temperature sensing element and the second automatically controls the heater in response to the output of the temperature sensor, and alarm circuitry monitoring the first and second control loops and providing a warning if, during operation of the apparatus, any of a number of predetermined hazard conditions develop.

4,051,206

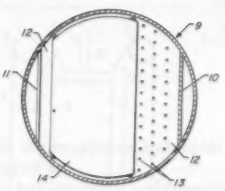
SIEVE-TYPE FRACTIONATION TRAYS

Bennie I. Bunas, Chicago, and Kenneth D. Uitti, Bensenville, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed May 10, 1976, Ser. No. 684,995

Int. Cl.[2] B01F *3/04*

U.S. Cl. 261—109 **1 Claim**



1. A sieve-type fractionation tray which comprises a liquid support plate having a horizontal upper surface and adapted to be mounted horizontally in a fractionation column and to retain a body of liquid thereon, said liquid support plate being divided into a receiving lateral half and a discharging lateral half which is adjacent a chordal outlet downcomer, said discharging interal half and said receiving lateral half of said liquid support plate having sieve-type vapor passageways located thereon, said sieve-type vapor passageways having a total open area equal to from 2 to 20 percent of said upper horizontal surface, and a flat imperforate sealing plate which rests upon said upper horizontal surface in a manner which covers and seals all said sieve-type vapor passageways located on said discharging lateral half of said liquid support plate and which leaves unsealed those sieve-type vapor passageways located on said receiving lateral half of said liquid support plate.

4,051,207

PROCESS FOR THE PRODUCTION OF PROPELLANT CHARGE POWDERS, ESPECIALLY NITROGUANIDINE POWDERS

Heinrich Brachert, Troisdorf-Oberlar, and Joachim Kleiss, Liebenau, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Dec. 29, 1975, Ser. No. 644,949
Claims priority, application Germany, Dec. 27, 1974, 2461646
Int. Cl.[2] C06B *21/00*
U.S. Cl. 264—3 B 14 Claims

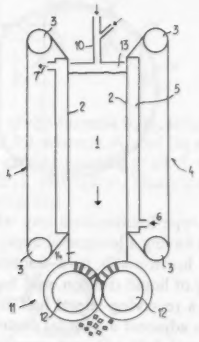
1. A process for the production of propellant charge powders from solvent-containing mixtures containing nitrocellulose, and components selected from the group consisting of diglycol dinitrate, nitroglycerin, nitroguanidine, penthrite, and hexogen and mixtures thereof, and further additives, which comprises premixing an alcohol-containing or a water-containing raw mixture containing nitrocellulose with additional required components of the propellant powder; then either incorporating a solvent in the alcohol-containing mixture and homogenizing and preplasticizing the solvent-containing premix of the components in a continuously operating kneading device or homogenizing and preplasticizing the water-containing premix of the components in the continuously operating kneading device, then only thereafter dewatering the mixture by drying and combining the mixture with a solvent; then plasticizing the solvent-containing preplasticized mixture in a continuously operating screw-type extruder; converting the resultant mixture into granular form; extruding the granulated material finally into a final powder form in a continuously operating screw-type extruder; and evaporating the solvent therefrom.

4,051,208

PROCESS FOR THE CONVERSION OF LIQUID PHASES OF NON-METALLIC SUBSTANCES, ESPECIALLY POLYMERIZABLE OR CRYSTALLIZABLE SUBSTANCES, INTO SOLID PHASES

Roland Jaccard, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 527,422, Nov. 26, 1974, abandoned, which is a continuation of Ser. No. 351,965, April 17, 1973, abandoned.
This application Oct. 29, 1975, Ser. No. 626,915
Int. Cl.[2] C08L *61/20;* B22D *23/08*
U.S. Cl. 264—5 4 Claims



1. A process for the fabrication of a condensation polymer based on urea and/or melamine and formaldehyde, said process comprising:

providing a vertically extending hollow reaction chamber having a horizontal cross-section shape in the form of a polygon and having a plurality of flat vertical walls each formed by a vertical run of a separate revolving endless band;

initially filling the upper end of said chamber with a liquid phase of a mixture of an aqueous solution of a pre-condensate of urea and/or melamine and formaldehyde in the presence of a protective colloid with a solution of sulphonic acid or a water-soluble ammonium hydrogen sulphate of the formula $[R—NH_3](+).[SO_4H](-)$, wherein R is a hydrogen atom or an organic radical which does not adversely affect the water-solubility, and allowing said liquid phase to convert to a solid phase;

supplying, at a rate dependent on the speed of conversion of said mixture from said liquid phase to said solid phase, a sufficient amount of said liquid phase into said chamber to maintain a thin layer of said liquid phase on top of said solid phase formed in said chamber; and

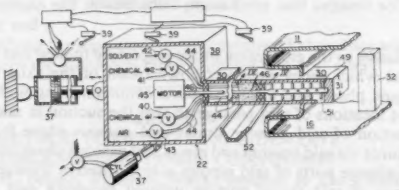
continuously passing said solid phase from said chamber and simultaneously comminuting said solid phase as it passes from said chamber.

4,051,209

CONTINUOUS RIGID FOAM PANEL PRODUCTION

Charles P. Tabler, Hamilton, Ohio, assignor to Kornylak Corporation, Hamilton, Ohio

Filed Apr. 22, 1975, Ser. No. 570,451
Int. Cl.[2] B29D *27/04*
U.S. Cl. 264—39 9 Claims



1. In a method of mixing two separately supplied chemicals to provide a foamable mixture and in response to a deposit signal, depositing the foamable mixture in a mold form to produce rigid synthetic foam, with contact between the two chemicals being only within a common mixture area before depositing, the improvement comprising: depositing the foamable mixture in response to a deposit signal in a mold form as the chemicals are supplied to, mixed in and flow through the common mixture area; thereafter discontinuing the depositing; thereafter automatically timing the period wherein mixed chemicals are maintained in the common mixture area without substantial depositing and flow of the chemicals through the mixture area; after said step of timing, depositing additional foamable mixture in response to a deposit signal only if the period of time after the last depositing step was discontinued is less than a fixed period of time that would result in substantial solidification of the chemicals, and preventing the depositing of additional foamable mixture despite the deposit signal only if the period of time after the last depositing step was discontinued is more than a fixed period of time that would result in substantial solidification of the chemicals; and automatically washing the mixture area with a solvent in response to the period of time after the last depositing step and before additional depositing exceeding a fixed period of time that would result in substantial solidification of the chemicals.

4. A method of forming rigid foam panels by depositing foamable chemicals in a generally horizontally extending closed top mold moving past a foam depositing apparatus in a molding direction with a transverse mold wall forming one end of the mold and thereafter allowing the foamable chemicals to foam and cure within the mold as it continuously moves through a foaming and curing zone, the improvement comprising the steps of: continuously moving the mold on an endless belt conveyor in the molding direction throughout the method; automatically sensing the position of the continuously moving transverse wall; automatically driving the foam depositing apparatus in the molding direction at the same speed as the continuously moving mold when the foam depositing appara-

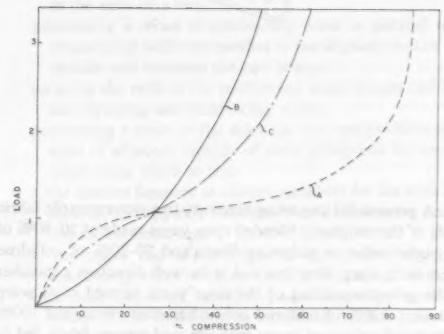
tus is adjacent the interior edge of the transverse wall, and simultaneously moving the foam depositing apparatus transversely into the mold while depositing foamable chemicals along the interior edge of the transverse wall for substantially the full length of the transverse wall; thereafter reducing the speed of the foam depositing apparatus in the molding direction so as to provide a relative speed in the molding direction between the foam depositing apparatus and the continuously moving mold, and simultaneously moving the foam depositing apparatus transversely back and forth within the mold while depositing the foamable chemicals to form a zigzag pattern of chemicals deposited within the mold; withdrawing the foam depositing apparatus and thereafter curing the foam within the continuously moving mold in a pressure tunnel formed between the endless belt conveyor and an opposed endless belt conveyor.

4,051,210

PROCESS FOR COMOLDING A COMPOSITE CUSHIONING STRUCTURE FROM A PNEUMACEL FIBER BATT AND SYNTHETIC ELASTOMERIC FOAM

Frederick Theodore Wallenberger, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 27, 1975, Ser. No. 581,093
Int. Cl.[2] B29D *27/04*
U.S. Cl. 264—45.4 **9 Claims**



1. A process of comolding a resin-bonded nonwoven batt of pneumacel fiber with an elastomeric foam comprising heating while confined a compressed thermoplastic resin-bonded nonwoven batt of pneumacel fiber to soften the binder and expand the batt to about twice its thickness; cooling the resulting expanded batt to set it in the expanded form; placing the expanded batt in a mold or on a continuous belt having lateral confinement and adding a layer of a precursor of an elastomeric foam to at least one surface of said batt to form thereby a shaped composite, said precursor making a minor but definite penetration of said batt; and curing the shaped composite.

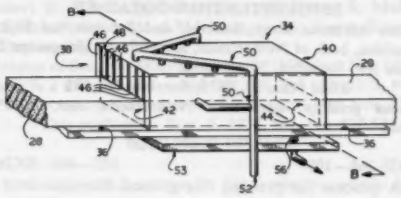
4,051,211

APPARATUS AND PROCESS

William Beser, Burbank, and Edwin R. Cole, Huntington Beach, both of Calif., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed May 20, 1976, Ser. No. 688,169
Int. Cl.[2] B29D *27/04*
U.S. Cl. 264—51 **6 Claims**

1. A process for minimizing atmospheric pollution produced by volatilization of isocyanate during formation of isocyanate-based polymer foam in a continuous bunstock operation which comprises passing said foam in the form of a continuous bun, after foam rise and gelatin have been completed, through a



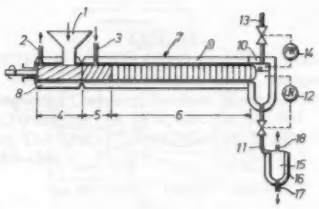
substantially enclosed zone of high relative humidity maintained at ambient temperature.

4,051,212

PROCESS FOR THE CONTINUOUS DEGRADATION OF PLASTICS

Ernst Grigat, and Hartmut Hetzel, both of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 29, 1975, Ser. No. 608,853
Claims priority, application Germany, Sept. 4, 1974, 2442387
Int. Cl.[2] C07C *87/14*; B29H *19/00*
U.S. Cl. 264—102 **5 Claims**



1. A process for the continuous hydrolytic degradation of waste plastics comprising

a. continuously introducing a hydrolyzable plastic waste material into a screw machine,

b. continuously allowing air to escape from said screw machine,

c. continuously introducing water into said screw machine, thereby producing a plastic-water mixture,

d. subjecting said mixture to a temperature of from 100° to 300° C, a pressure from 5 to 100 bars, and intensive screw mixing in a reaction zone of said screw machine for a period of from 2 to 100 minutes whereby liquid and gaseous hydrolysis products are formed,

e. continuously allowing the liquid and gaseous hydrolysis products to enter a liquid-gas separatory nozzle,

f. continuously allowing the liquid to leave the nozzle through a first regulating valve which maintains a constant liquid level in the nozzle, and

g. continuously allowing the gas to leave the nozzle through a second regulatory valve which maintains a constant pressure in the nozzle at a pressure of the reaction zone.

4,051,213

PROCESS FOR PRESSING BRIQUETTES FROM FINE-GRAINED FLUORSPAR AND PRESSED BRIQUETTES THUS OBTAINED

Albertus Adrianus Kooy, Schoorl, and Jacobus van Rijkom, Ijmuiden, both of Netherlands, assignors to Hoogovens Ijmuiden BV, Ijmuiden, Netherlands

Filed Mar. 25, 1975, Ser. No. 561,691

Claims priority, application Netherlands, Apr. 5, 1974, 7404651

Int. Cl.² C04B *35/00*

U.S. Cl. 264—109 **3 Claims**

1. A process for pressing fine-grained fluorspar into briquettes, comprising mixing intimately fine-grained fluorspar having a maximum grain size of 6 mm with 1 to 5% by weight of blast furnace cement and then with 1 to 6% by weight of water glass at room temperature and subsequently pressing the mixture into briquettes in a briquet press.

4,051,214

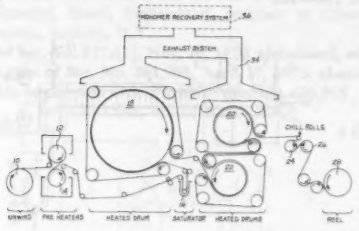
METHOD OF CONTROLLING MONOMER LOSS DURING THE PRODUCTION OF A FIBER-THERMOPLASTIC MATRIX BY IN SITU BULK POLYMERIZATION

Richard R. Casper, and Myron P. Marander, both of Longview, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Continuation-in-part of Ser. No. 653,980, Jan. 30, 1976, abandoned. This application Jan. 14, 1977, Ser. No. 759,603

Int. Cl.² B29D *7/20, 27/00*

U.S. Cl. 264—137 **8 Claims**



1. In a method for making a moldable, fiber-thermoplastic matrix by in situ bulk polymerization wherein a fibrous web of less than 0.25 inch thickness is impregnated with a liquid polymerizable composition, comprising a monomer and a thermally activated free radical initiator wherein the matrix after polymerization contains at least 25% polymer by weight and said bulk polymerization is completed in less than 8 minutes, the improvement whereby monomer loss is controlled during polymerization, which comprises:

confining the impregnated web matrix between heat transfer surfaces wherein the matrix is subjected to a pressure of 0.2 to 20 psig;

heating the impregnated matrix to an initial temperature sufficient to initiate polymerization but below the boiling point of the polymerizable composition;

raising the temperature as the boiling point of the composition increases during polymerization while still maintaining the temperature below said boiling point; and

increasing the temperature above the boiling point when polymerization is nearly complete in order to evaporate residual monomer from the composition.

4,051,215

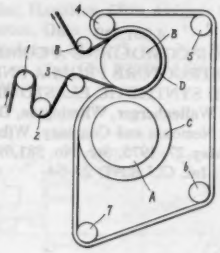
PROCESS FOR IMPARTING ELASTICITY TO WOVEN TEXTILE FABRICS

Motohiro Tsuruta, Kyoto; Hiroshiro Kimura, Ashiya; Akio Koshimo; Hirohisa Nara, both of Uji, all of Japan; Tokuju Goto, Dusseldorf, Germany, and Kunio Amemiya, Kyoto, Japan, assignors to Unitika Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 552,453, Feb. 24, 1975, abandoned, which is a continuation of Ser. No. 68,263, Aug. 26, 1970, abandoned, which is a division of Ser. No. 711,668, March 8, 1968, Pat. No. 3,538,563. This application Dec. 31, 1975, Ser. No. 645,721

Int. Cl.² B29G *5/00*

U.S. Cl. 264—137 **4 Claims**



1. A process for imparting elasticity to a woven textile fabric made of thermoplastic blended spun yarns made of 50–80% of poly-ether-ester or polyester fibers and 50–20% of cellulose fibers in its warp direction and in its weft direction a member of the group consisting of the same yarns as used in its warp direction, 100% of textured poly-ether-ester yarns, and 100% of textured polyester yarns, wherein said woven fabric fed to said process has a low initial web density in its weft direction, and the resultant fabric of the instant process has an elastic recovery of 65 to 90% and an elongation of 10 to 25% in its warp direction and has 5 to 60% greater web density than said feed fabric, which comprises:

a. rotating a heating drum,

b. rotating a deformable elastic roller, the drum and the roller having a parallel axis and the same peripheral velocity,

c. passing a flexible elastic belt through the nip between the drum and the roller,

d. contacting the belt with the heating drum around a substantial proportion of its periphery beyond the nip,

e. applying a cellulose reactive resin solution to the fabric,

f. feeding the fabric so treated in its warp direction into the nip between the heating drum and the flexible belt so as to shrink the fabric by 10–30% in its warp direction, whereby said fabric is compressed owing to the deformation of the deformable elastic roller as well as the deformation of the flexible elastic belt,

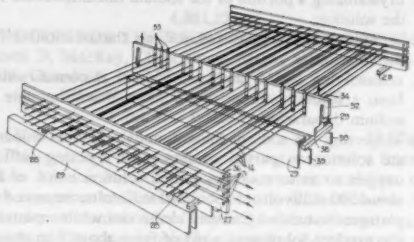
g. temporarily heat-setting the fabric in its altered state by contacting it with the heating drum at a temperature of 130°–150° C, and

h. completely heat-setting the fabric at a temperature of 150°–200° C for a period of 1–5 minutes.

4,051,216
IN-LINE MOULDING OF PRESTRESSED CONCRETE ARTICLES

Robert Lyndon Bratchell, Ottoway, Australia, assignor to Concrete Industries (Monier) Limited, Ottoway, Australia

Continuation-in-part of Ser. No. 295,996, Oct. 10, 1972, abandoned. This application Dec. 4, 1974, Ser. No. 529,365
Claims priority, application Australia, Oct. 27, 1971, 6809/71
Int. Cl.[2] B28B *23/04*
U.S. Cl. 264—157 6 Claims



1. A method of moulding concrete ties comprising the steps:
aligning a series of similar multi-cavity open ended moulds end to end in a plurality of groups, and between end beams at the ends of a bay,
positioning a series of reinforcing wires in parallel spaced relationship with one another in the aligned cavities of the moulds and between the end beams,
securing the ends of the reinforcing wires to said end beams and straining said reinforcing wires,
positioning a series of flat sided bar-like spacers between the ends of adjacent moulds of each group and between the reinforcing wires so that:
a. the spacers function as closure members for the ends of the moulds, the opposite flat sides thereof becoming contiguous mould ends, and
b. the upper and lower edges of the spacers engage the reinforcing wires to retain them in horizontal rows,
each said flat-sided bar-like spacer extending across the width of the multi-cavity moulds and spaced vertically from adjacent said flat-sided bar-like spacers solely by the wires retained by said adjacent bars in a said horizontal row,
positioning a plurality of flat spacer plates each between adjacent ends of said groups, each plate extending across the width of the multi-cavity moulds and having transversely spaced vertically extending slots extending downwardly from its upper edge, and elevating the flat plates to engage the wires in the slots and also to cause its opposite side faces to function as closure means for contiguous mould ends, the edges defining the slots retaining the wires in vertical rows,
driving the moulds towards one another by an amount sufficient to close any gaps which exist between the mould ends and said spacers and said spacer plates,
discharging a wet mix of concrete into the moulds to surround the reinforcing wires and allowing the concrete to set,
withdrawing the flat-sided bar-like spacers endwise from between the horizontal rows of wires in a lateral direction and depressing flat spacer plates from between the rows of wires in a vertically downwards direction against resistance to concrete fracture by the mould bases to thereby expose the wires between adjacent ends of aligned moulds, and between the groups, and
severing the wires between each pair of adjacent moulds.

4,051,217
FABRICATION PROCESS FOR MULTIPHASED PLASTICS

Robert D. Lundberg, Somerville, and Henry S. Makowski, Scotch Plains, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

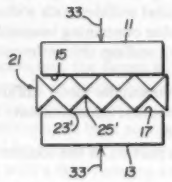
Division of Ser. No. 483,977, June 28, 1974, Pat. No. 3,939,242, which is a division of Ser. No. 331,628, Feb. 12, 1973, Pat. No. 3,842,154, which is a division of Ser. No. 199,799, Nov. 17, 1971.
This application Sept. 5, 1975, Ser. No. 610,821
Int. Cl.[2] B29C *25/00*
U.S. Cl. 264—230 12 Claims

1. An improved process for fabricating an article from an ionomer derived from a thermoplastic backbone polymer having groups pendant thhereto, said groups being selected from the group consisting essentially of metal sulfonate groups or metal carboxylate groups, said groups being present in from at least about 0.2 to about 15 mole percent (i.e. 0.002 to .15 moles per mole of monomer) and being capable of forming ionic physical crosslink said ionomer containing about 0.5 to about 10 moles of a volatile preferential plasticizer per mole of ionic groups, which said ionomer has been previously formed in a first desired shape, said first desired shape being substantially free of said volatile preferential plasticizer wherein the improvement comprises:
a. re-forming the product in a second desired shape; at a temperature above the softening point of the thermoplastic backbone but below the ultimate softening point, wherein the ultimate softening point is the temperature at which the ionomer flows; and
b. cooling below the softening point of the softening point while retaining the second desired shape.

4,051,218
METHOD OF WELDING PLASTIC SEAMS

Joseph G. Hotton, Sterling Heights, Mich., assignor to Neumann Engraving Company, Madison Heights, Mich.

Filed Apr. 30, 1976, Ser. No. 681,980
Int. Cl.[2] B29C *17/00;* B29D *9/00;* B29F *5/00*
U.S. Cl. 264—248 7 Claims



1. A method of welding together first and second thermoplastic surfaces to form a strong watertight bond therebetween comprising the steps of simultaneously serrating the first and second surfaces by simultaneously softening and shaping said surfaces with a heated forming element interposed therebetween to form ridges and valleys on each of said surfaces; withdrawing said forming element; and thereafter pressing the first and second surfaces together, with the ridges of the first surface substantially opposite and aligned with the ridges of the second surface to collapse the ridges and to flow the softened thermoplastic material into the valleys until a single continuous watertight seam is formed therebetween.

4,051,219
METHOD OF PREPARING FLUORINE-FREE RARE EARTH METAL COMPOUNDS FROM SUCH COMPOUNDS CONTAINING FLUORINE

Leo Hafner, Althofen, Austria, assignor to Treibacher Chemische Werke Aktiengesellschaft, Treibach, Austria

Filed July 21, 1976, Ser. No. 707,382
Claims priority, application Austria, July 25, 1975, 5802/75
Int. Cl.² C01F *17/00*
U.S. Cl. 423—21 **5 Claims**

1. A method of producing a fluorine-free rare earth metal compound from a rare earth metal salt containing fluorine, the rare earth metal including cerium, comprising the steps of preparing an acidic solution of the salt in the presence of an amount of boric acid sufficient to sequester the fluorine ions in the salt, the amount of boric acid being determined by the equation

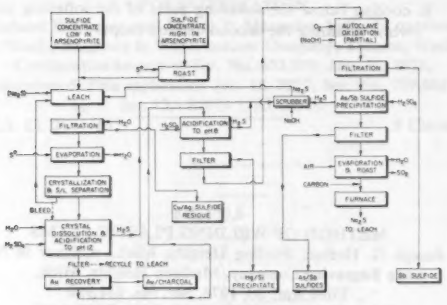
$$4\,HF + H_3BO_3 = 3\,H_2O + HBF_4,$$

whereby the fluorine ions are bound in the solution, and separating the fluorine-free earth metal salt from the solution.

4,051,220
SODIUM SULFIDE LEACH PROCESS

Enzo L. Coltrinari, Arvada, Colo., assignor to Equity Mining Corporation, Vancouver, Canada

Filed Mar. 1, 1976, Ser. No. 662,583
Int. Cl.² C01G *7/00, 57/00*
U.S. Cl. 423—24 **16 Claims**



10. A process for treating metal sulfides including gold in the presence of antimony sulfide comprising:

a. leaching the metal sulfides with sodium sulfide in order to produce a residue containing insoluble sulfides and a solution comprising sodium thioantimonite and the remaining metal sulfide values;

b. separating the insoluble metal sulfides from the solution;

c. oxidizing the sodium thioantimonite in solution to sodium thioantimonate;

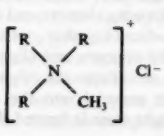
d. crystallizing a portion of the sodium thioantimonate from the solution;

e. separating the crystallized sodium thioantimonate from the solution;

f. redissolving the crystallized sodium thioantimonate;

g. adjusting the pH of the solution resulting from the redissolving of the crystals to about 12;

h. contacting the redissolved sodium thioantimonate solution with an ion exchange agent loaded onto an activated carbon surface, the ion exchange agent comprising:



wherein R is a mixture of C_8 and C_{10} carbon chains, in order to remove substantially all of the gold from solution.

11. A process for treating metal sulfides including arsenic sulfides in the presence of antimony sulfide comprising:

a. leaching the metal sulfides with sodium sulfide in order to produce a residue containing insoluble sulfides and a solution comprising sodium thioantimonite and the remaining metal sulfide values;

b. separating the insoluble metal sulfides from the solution;

c. oxidizing the sodium thioantimonite in solution to sodium thioantimonate;

d. crystallizing a portion of the sodium thioantimonate from the solution;

e. separating the crystallized sodium thioantimonate from the solution;

f. redissolving the crystallized sodium thioantimonate to form a solution comprising sodium thioantimonate and sodium thioarsenate;

g. subjecting the sodium thioantimonate/sodium thioarsenate solution to partial oxidation by injecting sufficient oxygen so as to maintain a final solution e.m.f. of from about 300 millivolts to about 500 millivolts, measured with platinum/saturated Calomel electrodes while maintaining the product solution at a pH of from about 7 to about 11 in order to oxidize and precipitate a substantial portion of the sodium thioantimonate as antimony sulfide while leaving substantially all of the sodium thioarsenate in solution.

4,051,221
PROCESS FOR THE SEPARATE RECOVERY OF VANADIUM AND MOLYBDENUM

Wilhelmus Pannekeet, Haarlem, Netherlands; Gerhard E. W. K. Steenken, Berzbuir, Germany, and Roeland H. Voogd, Purmerend, Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Apr. 12, 1976, Ser. No. 675,659
Claims priority, application Netherlands, Apr. 16, 1975, 7504500
Int. Cl.² C01G *31/00, 39/00*
U.S. Cl. 423—54 **8 Claims**

1. A process of separately recovering vanadium and molybdenum from an aqueous solution containing a vanadium compound and a molybdenum compound, comprising the steps of:

a. adjusting the pH of said aqueous vanadium-and-molybdenum-containing solution to a value between 1.5 and 7;

b. contacting said solution with a weakly basic anion exchanger in the salt form;

c. eluting said anion exchanger with an ammonium hydroxide solution having a strength between about 1 and 4N; and

d. crystallizing the resulting ammonium vanadate and separating same from the vanadium-and molybdenum solution obtained in said elution.

4,051,222
COARSENING OF PARTIALLY CALCINED ALUMINA DUST

Bohdan Gnyra, Arvida, Canada, assignor to Alcan Research and Development Limited, Montreal, Canada

Continuation-in-part of Ser. No. 182,481, Sept. 21, 1971, Pat. No. 3,906,084. This application June 26, 1975, Ser. No. 590,593
The portion of the term of this patent subsequent to Sept. 16, 1992, has been disclaimed.
Int. Cl.² C01F *7/06, 7/14*
U.S. Cl. 423—127 **26 Claims**

1. A method of coarsening partially calcined alumina dust recovered during the calcining of alumina trihydrate to produce alumina which comprises forming an aqueous admixture or slurry consisting essentially of partially calcined alumina dust recovered during the calcining of alumina trihydrate to alumina, said partially calcined alumina dust exhibiting a loss

on ignition of about 12–20% by weight after 1 hour at 1000° C. and being comprised of a mixture of α-Al_2O_3, γ-Al_2O_3, $Al_2O_3.H_2O$ and $Al_2O_3.3H_2O$, said $Al_2O_3.H_2O$ being present in said mixture in an amount of about 5% up to about 20% by weight, said mixture having a particle size such that at least 80–90% weight is less than 44 microns, and finely divided calcium carbonate or calcite and introducing the resulting aqueous admixture or slurry into filtered Bayer pregnant liquor and precipitating alumina trihydrate from the resulting Bayer pregnant liquor.

4,051,223

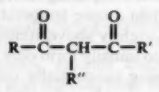
PROCESS FOR THE RECOVERY OF MAGNESIUM

Kenneth D. MacKay, Circle Pines, Minn., assignor to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed Nov. 10, 1975, Ser. No. 630,599
Int. Cl.² B01D *11/04*
U.S. Cl. 423—157 **13 Claims**

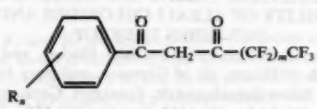
1. The process of selectively recovering magnesium from an aqueous solution thereof which also contains calcium ions which comprises contacting said solution with a solution of a quaternary ammonium salt of a hydrogen ion exchange reagent in an essentially water-immiscible organic solvent to extract at least a portion of but less than 100% of the magnesium values into the organic phase, separating the magnesium loaded organic phase from the aqueous phase and stripping magnesium from the organic phase, said hydrogen ion exchange reagent being selected from the group consisting of:

A. β-diketones having the formula



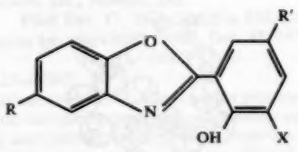
where R is phenyl or alkyl substituted phenyl, R′ is alkyl, alkyl substituted phenyl or chloro substituted phenyl and R″ is H or —CN with the provisos that (1) when R is phenyl, R′ is a branched chain alkyl group of at least seven carbon atoms and (2) when R is alkyl substituted phenyl, the number of carbon atoms in the alkyl substituent or substituents is at least 7 and at least one such alkyl substituent is branched chain;

B. fluorinated β-diketones having the formula



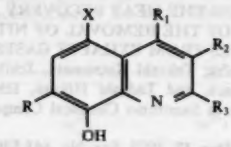
where n is a whole integer of 1 to 4, m is 0, 1 or 2 and R is an alkyl group of 1–25 carbon atoms;

C. benzoxazoles having the formula



where R is hydrogen or an alkyl group having from 1 to 20 carbon atoms, R′ is hydrogen, chlorine or an alkyl group containing from 1 to 20 carbon atoms, X is H or chlorine and the total number of carbon atoms in R and R′ is 6 to 40 with the proviso that one of R and R′ must be an alkyl group of at least 6 carbon atoms; and

D. 8-hydroxyquinolines of the formula



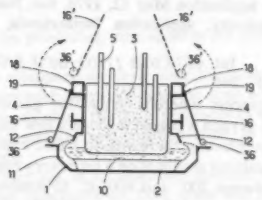
where R is a branched chain alkyl or alkenyl radical containing about 8 to 20 carbon atoms, R_1, R_2 and R_3 are hydrogen or alkyl groups of 1 to 4 carbon atoms and X is H, chlorine or bromine.

4,051,224

PROCESS AND APPARATUS FOR COLLECTING THE FUMES GIVEN OFF DURING THE PRODUCTION OF ALUMINIUM IN AN ELECTROLYSIS CELL WITH A CONTINUOUS ANODE

Daniel Duclaux, Lille; Andre J. A. Pontier, and Georges Paul Ferret, both of St. Jean de Maurienne, all of France, assignors to Aluminum Pechiney, Lyon, France

Division of Ser. No. 569,080, April 17, 1975, Pat. No. 4,002,551.
This application Oct. 31, 1975, Ser. No. 627,596
Int. Cl.² B01D *53/34*
U.S. Cl. 423—210 **1 Claim**



1. A process for collecting the fumes given off during the production of aluminum in an electrolysis cell with a continuous anode consisting of a carbon mass accommodated in a tube and immersed in an electrolysis bath accommodated in a tank closed at its lower end by a cathode, comprising providing the lower end of the tube with a skirt forming a primary collection circuit for the gases and dust given off at the lower end of the anode, displacing a panel which extends longitudinally across the bath to within a short distance from the surface of the bath thereby permitting free flow of air through the narrow passage between the lower edge of the panel and the bath when in operative position, moving the panel in the direction away from the surface of the bath whereby access can be had to the surface of the bath when in raised position, closing the surface of the electrolysis bath along each of the short sides of cell "heads", by a fixed hooding closed laterally in fluid-tight manner by the two longitudinal panels, withdrawing the gases from the primary circuit and processing such gases for purification and treatment, separately withdrawing the gases from between the panel and the tube and separately processing such gases for purification and treatment.

4,051,225

METHOD FOR THE HEAT RECOVERY IN THE PROCESSES OF THE REMOVAL OF NITROGEN OXIDES FROM EXHAUST GASES

Shujiro Shiga, Chiba; Takeshi Katsumata, Ichihara; Yasushi Okamoto, Ichihara, and Tadashi Hikasa, Ichihara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 17, 1975, Ser. No. 641,536

Claims priority, application Japan, Dec. 18, 1974, 49-145901; July 17, 1975, 50-87963

Int. Cl.[2] C01B *21/00, 17/00*

U.S. Cl. 423—235 4 Claims

1. In a method for heat recovery during processes for the removal of nitrogen oxides from combustion gases containing sulfur oxides and nitrogen oxides by a catalytic or non-catalytic reduction thereof with ammonia wherein the exhaust gases are introduced into a heat exchanger supplied with air wherein the improvement comprises maintaining at the entrance to said heat exchanger the molar ratio of ammonia to sulfuric anhydride sufficient to form ammonium hydrogen sulfate and in the range of about $O < NH_3/SO_3 < 2$ and a steam concentration of more than 12% by volume, and removing the ammonium hydrogen sulfate in the molten state from the heat exchanger.

4,051,226

PREVENTION OF EXPLOSIVE MIXTURES IN THE REGENERATION OF SULFUR OXIDE ACCEPTORS

Gernot Staudinger, and Jaap E. Naber, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 555,322, March 4, 1975, abandoned. This application May 12, 1976, Ser. No. 685,823

Claims priority, application Netherlands, Mar. 5, 1974, 7402928

Int. Cl.[2] C01B *17/00;* B01J *8/00*

U.S. Cl. 423—244 4 Claims

1. In a process wherein (A) a flue gas containing sulfur dioxide and oxygen is passed through a first inlet duct and open valve communicating therewith to a first reactor containing a copper-containing acceptor on a refractory carrier at a temperature of between 200° and 600° C, to remove sulfur dioxide from the flue gas, and then the purified flue gas is passed from the first reactor through an open valve communicating with a first outlet duct, and (B) wherein the valves communicating with the first inlet duct and the first outlet duct of said first reactor are closed, and the flue gas containing the sulfur dioxide and oxygen is then passed through another first inlet duct and open valve communicating therewith to a second reactor containing a copper-containing acceptor on a refractory carrier at a temperature between 200° and 600° C, to remove sulfur dioxide from the flue gas, and then the purified flue gas is passed from the second reactor through an open valve communicating with another first outlet duct, while, (C) concomitantly passing a hydrogen-containing gas through a second inlet duct and open valve communicating therewith to said first reactor at a temperature between 200° and 600° C to regenerate the acceptor and then passing the hydrogen-containing gas from said first reactor through an open valve-communicating with a second outlet duct, the improvement comprising, preventing hydrogen build-up from valve leakage into the first inlet duct of the first reactor during step (C) by passing a quantity of flue gas sufficient to prevent hydrogen build-up through the first inlet duct of the first reactor and then to the first inlet duct of the second reactor.

4,051,227

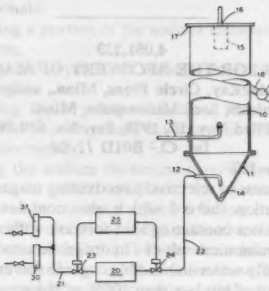
METHOD FOR REDUCING URANIUM TETRAFLUORIDE

Henry M. Heidt, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Division of Ser. No. 444,624, Feb. 22, 1974, Pat. No. 3,979,499, which is a continuation of Ser. No. 17,682, March 9, 1970, abandoned. This application June 28, 1976, Ser. No. 700,377

Int. Cl.[2] C01G *43/06*

U.S. Cl. 423—259 1 Claim



1. A process for the treatment of uranium hexafluoride which comprises the steps of passing a flow of gaseous uranium hexafluoride to a reaction zone, passing a pulsed flow of a gaseous reactant medium comprising an organic halide into the reaction zone to maintain a zone temperature on the order of 600° F and a pressure slightly above atmosphere to enable the uranium hexafluoride to initially form only from said gases fine solid particles containing substantially only UF_4, continuing the treatment of the uranium hexafluoride within said reaction zone to increase the size of the formed fine particles and to accumulate further fine particles in the reaction zone, and adjusting the rate of pulsed flow of reactant medium to the reaction zone by increasing the pressure of the reactant medium to a maximum pressure about twice atmospheric while simultaneously reducing the frequency of the pulsed flow in accordance with the amount of solid particles therein.

4,051,228

PREVENTING CAKING AND OBTAINING FLOWABILITY OF ALKALI CHLORIDES AND SALT MIXTURES THEREOF

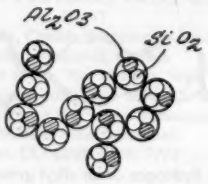
Helmut Knorre, Seligenstadt; Joachim Fischer, and Gerhard Pohl, both of Hanau, all of Germany, assignors to Deutsch Gold-und Silber-Scheideanstalt, Frankfurt, Germany

Filed May 20, 1975, Ser. No. 579,158

Claims priority, application Germany, Nov. 29, 1974, 2456434

Int. Cl.[2] C01G *3/26*

U.S. Cl. 423—268 7 Claims



1. A flowable alkali metal chloride composition resistant to caking on storage including as an anticaking agent (A) in complex iron cyanide (B) a water insoluble, inorganic, inert, finely divided hydroxyl group containing carrier material,

optionally (C) and including (D) where (C) is a hydrophobizing material and (D) is

1. is a polyacrylate (2) poly-(alpha-hydroxyacrylate), (3) maleic acid homo or copolymer, (4) itaconic acid homo or copolymer or (5) a salt of (1), (2), (3) or (4), said materials (A), (C) and (D) being present on B, said anticaking agent providing a permanent moisture content of at least 0.01 weight % of water on the salt.

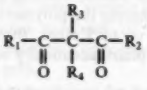
6. A flowable alkali metal chloride composition resistant to caking on storage including as an anticaking agent (A) sodium, potassium or calcium ferrocyanide (B) a water insoluble, inorganic, inert finely divided hydroxyl group containing carrier material, optionally (C) and including (D) where C is a hydrophobizing material and (D) is the sodium salt of a polycarboxylate having carbonyl groups, hydroxyl groups, or both carbonyl and hydroxyl groups and (D) is present in an amount of 0.001 to 0.1 weight % based on alkali metal chloride, said materials (A) (C) and (D) being present on B, said anticaking agent providing a permanent moisture content of at least 0.01 weight % of water on the salt.

4,051,229
PROCESS FOR MANUFACTURING CHLORINE DIOXIDE

Isao Isa, Misato; Morioki Shibuya, Shibukawa, and Makoto Ebisawa, Kiryu, all of Japan, assignors to The Japan Carlit Co., Ltd., Tokyo, Japan

Filed Oct. 6, 1976, Ser. No. 730,196
Claims priority, application Japan, July 12, 1976, 51-82707
Int. Cl.² C01B *11/02*
U.S. Cl. 423—478 **20 Claims**

1. A process for manufacturing chlorine dioxide by reducing a chlorate selected from the group consisting of sodium chlorate, potassium chlorate, calcium chlorate and magnesium chlorate, in a strong acid selected from the group consisting of sulfuric acid present in a concentration of from about 0.5 to about 6 moles per liter of reaction medium, hydrochloric acid in a concentration of from about 0.01 to about 4 moles per liter of reaction medium and a mixture thereof, in the presence of a complex catalyst consisting of palladium (II) and a β-diketone of the formula



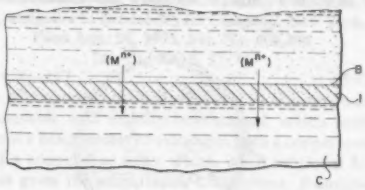
wherein R_1 and R_2 are selected from the group consisting of hydrogen, an alkyl radical having from 1 to 10 carbon atoms and an aryl radical; and R_3 and R_4 are selected from the group consisting of hydrogen and a methyl radical.

4,051,230
LIQUID-LIQUID EXTRACTION PROCESS OF METALS

Terukatsu Miyauchi, Yokohama, Japan, assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Dec. 17, 1974, Ser. No. 533,645
Claims priority, application Japan, Dec. 18, 1973, 48-142040
Int. Cl.² B01D *11/04*
U.S. Cl. 423—658.5 **7 Claims**

1. A continuous liquid-liquid extraction process of extracting heavy metal cations from an aqueous solution extraction feed containing said cations, which process comprises bringing said aqueous solution into contact with one side of a chemically resistant membrane, said membrane having continuous fine pores impregnated and filled with a first organic extractant containing a chelating agent, and bringing a second aqueous extractant in contact with the other side of said membrane, while maintaining the pH value of the extraction feed greater than that of the second extractant, whereby said heavy metal cations dissolved in said feed solution are transferred from said extraction feed to said first extractant supported in said fine pores with complexing, through said membrane, due to the decreasing concentration of the metal chelate and into said

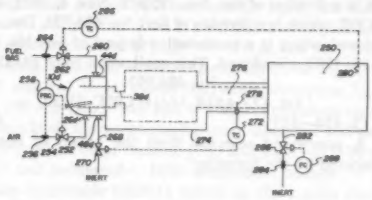


second extractant from said membrane with regeneration of the chelating agent and release of said metal cation.

4,051,231
PRODUCTION OF INTERNAL ATMOSPHERES FOR KILNS

Desmond H. Bond; George W. Taggart, both of Dallas, and Kurt S. Jaeger, Hurst, all of Tex., assignors to Ford, Bacon & Davis Texas, Inc., Garland, Tex.

Division of Ser. No. 508,671, Sept. 23, 1974, Pat. No. 3,963,443. This application Mar. 31, 1976, Ser. No. 672,408
Int. Cl.² B01J *7/00*; C01B *1/00*; F27B *1/26*; G05D *23/00*
U.S. Cl. 423—659 **7 Claims**



7. A process for producing atmospheres for kilns comprising:

a. creating an elongated air flow zone the outlet of which communicates with a thermal reaction zone wherein air is passed uniformly about the inner periphery of said air flow zone, toward said thermal reaction zone, in a parabolic velocity front;

b. injecting a fuel gas, in a controlled amount, from points radial of said elongated air flow zone and adjacent its outlet in a manner such that said fuel gas impinges the air being passed in said thermal reaction zone;

c. injecting an inert gas in a controlled amount from points adjacent to the points of injection of said fuel gas and in substantially the same direction as said fuel gas;

d. igniting the mixture of fuel gas, air, and inert gas in said thermal reaction zone to produce an atmosphere of desired composition; and

e. passing said atmosphere of desired composition into a kiln.

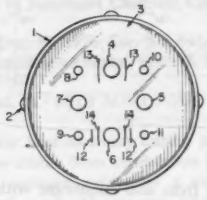
4,051,232
SEROLOGIC TEST FOR SYSTEMIC CANDIDIASIS

Walter P. Protzman, Hopewell, and George L. Evans, Hopatcong, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Aug. 12, 1975, Ser. No. 603,896
Int. Cl.² G01N *33/16, 31/02*
U.S. Cl. 424—12 **6 Claims**

1. In an in vitro test method for the diagnosis of systemic candidiasis in a mammalian host, said test method being based on precipitin formation between antibodies in a blood serum sample from said host and antigens in solution, said antibodies and antigens each diffusing through an agar layer maintained at

a pH of 7 to 9.6, to encounter one another and form said precipitin, the improvement which comprises incorporating in said antigen solution a concentration of protein antigens in the range of 0.5 to 10 mg. per ml and a concentration of mannan



antigen in the range of 0.025 to 1 mg. per ml, the weight ratio of said protein antigens to mannan being in the range of 5:1 to 10:1 said protein and mannan antigens prepared from the yeast phase, whereby false readings are reduced.

4,051,233

2-NAPHTHYLACETIC ACID DERIVATIVES AND COMPOSITIONS AND METHODS THEREOF

John H. Fried, and Ian T. Harrison, both of Palo Alto, Calif., assignors to Syntex Corporation, Palo Alto, Calif.

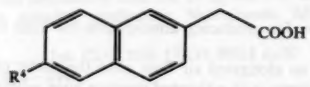
Division of Ser. No. 494,652, Aug. 5, 1974, Pat. No. 3,980,699, which is a division of Ser. No. 195,878, Nov. 4, 1971, Pat. No. 3,896,157, which is a division of Ser. No. 694,771, Dec. 7, 1967, abandoned, which is a continuation-in-part of Ser. No. 608,997, Jan. 13, 1967, abandoned. This application May 10, 1976, Ser. No. 684,993

Int. Cl.[2] A61K *31/19*; C07C *63/36*

U.S. Cl. 424—317 **9 Claims**

1. A compound selected from the group of compounds represented by the formula:

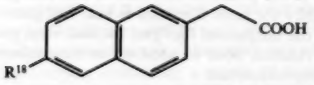
(XI)



wherein R^4 is aryl, and the corresponding esters, and pharmaceutically accepted addition salts thereof.

4. A method of effecting treatment of inflammation, pain, pyrexia, and pruritus which comprises administering an effective therapeutic dose of a compound selected from the group of compounds represented by the formula:

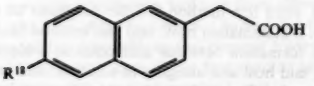
(I)



wherein R^{18} is aryl, or a corresponding ester or pharmaceutically acceptable addition salts thereof.

7. A pharmaceutical composition for use in effecting treatment of inflammation, pain, fever, and itching which comprises a pharmaceutically acceptable non-toxic excipient and a therapeutically effective amount of a compound represented by the formula:

(I)



wherein R^{18} is aryl, or a corresponding ester or pharmaceutically acceptable addition salt thereof.

4,051,234

ORAL COMPOSITIONS FOR PLAQUE, CARIES, AND CALCULUS RETARDATION WITH REDUCED STAINING TENDENCIES

Henry Anthony Gieske, Covington, Ky., and Prem Sagar Juneja, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

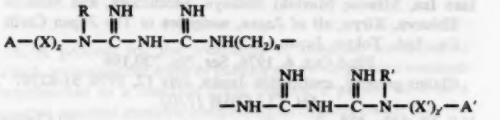
Continuation-in-part of Ser. No. 584,304, June 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 495,951, Aug. 9, 1974, abandoned. This application Apr. 29, 1976, Ser. No. 681,867

Int. Cl.[2] A61K *7/18, 7/22*

U.S. Cl. 424—52 **20 Claims**

1. An oral composition effective in inhibiting bis-biguanide tooth staining and the formation of plaque, caries and calculus comprising a carrier suitable for use in the oral cavity and

A. from about 0.01% to about 2.5% by weight of a tooth staining bis-biguanide compound, otherwise tending to produce a rather offensive brown tooth stain upon continuous oral use and having the generic formula:



wherein A and A′ each represent either (1) a phenyl radical which can contain as substituents up to two alkyl or alkoxy groups containing from 1 to about 4 carbon atoms, a nitro group, or a halogen atom; (2) an alkyl group containing from 1 to about 12 carbon atoms; or (3) alicyclic groups containing from 4 to about 12 carbon atoms; wherein X and X′ each represent an alkylene radical containing from 1 to 3 carbon atoms; wherein z and z′ each can be either 0 or 1; wherein R and R′ each represent either hydrogen, an alkyl radical containing from 1 to about 12 carbon atoms, or an aralkyl radical containing from 7 to about 12 carbon atoms; wherein *n* is an integer from 2 to 12 inclusive; and wherein the polymethylene chain $(CH_2)_n$ can be interrupted by up to 5 ether, thioether, phenyl, or naphthyl moieties; or the pharmaceutically acceptable salts thereof; and

B. from about 0.10% to about 1.25% by weight of the composition of a chelator in excess of the amount of chelator which will react with the bis-biguanide compounds, and which in said concentration range effectively reduces said bis-biguanide tooth stain without precipitating said tooth-staining bis-biguanide, said chelator being an amino carboxylate compound selected from the group consisting of: Ethylene-diaminediacetic acid and the water-soluble pharmaceutically acceptable salts thereof, said composition having a pH of from about 4.5 to about 9.5.

4,051,235

METHOD OF PREPARING BOVINE COLOSTRUM FOR USE IN TREATING LIVESTOCK

Robert R. Plymate, 1079 South St., Blair, Nebr. 68008

Filed Apr. 22, 1976, Ser. No. 679,470

Int. Cl.[2] A61K *39/00*

U.S. Cl. 424—85 **9 Claims**

1. The method of preparing bovine colostrum for use in treating livestock comprising the following steps,

collecting bovine colostrum milk,

removing substantially all of the fat from the colostrum milk,

removing the casein from the colostrum milk to obtain bovine colosteral whey,

dializing the whey,

adjusting the pH of the dialsate to 4.0–4.5,

precipitating the whey,
removing the supernant from the precipitated whey,
clarifying the supernant,
adding a water, saline and phenol mixture to the clarified supernant to obtain the desired concentration,
sterilizing the mixture,
and placing the sterilized mixture into containers for subsequent storage and use.

4,051,236

INHIBITION OF BLOOD PLATELET AGGREGATION

Don Navarro Harris, Somerset; Marie B. Phillips, Skillman, and Harold Jacob Goldenberg, Highland Park, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 332,847, Feb. 15, 1973, abandoned. This application May 20, 1976, Ser. No. 688,501
Int. Cl.[2] A61K *35/14*
U.S. Cl. 424—101 7 Claims

1. A method of inhibiting aggregation of human blood platelets which comprises contacting the platelets with PGE_1 and a compound which potentiates the effectiveness of PGE_1, which compound is a member selected from the group consisting of
4-(Butylamino)-1-ethyl-1H-pyrazolo[3,4-b]pyridine-5-carboxylic acid, ethyl ester
4-Chloro-1-ethyl-3-methyl-1H-pyrazolo[3,4-b]pyridine-5-acetonitrile
1-Ethyl-4-(isopropylidenehydrazino)-3-methyl-1H-pyrazolo[3,4-b]pyridine-5-carboxylic acid, ethyl ester, or its hydrochloride, hemihydrate
3-Ethyl-7,12-dimethylpyrazolo[4',3':5,6]pyrido[4,3-b]-[1,5]benzodiazepin-6-(3H)-one
3-Ethyl-7,12-dihydro-9-methoxy-7,12-dimethyl-pyrazolo[3',4':2,3]pyrido[4,5-b][1,5]benzodiazepin-6(3H)-one
4-(Butylamino)-1H-pyrazolo[3,4-b]pyridine-6-carboxylic acid, ethyl ester
4-(Butylamino)-1-ethyl-1,7-dihydro-7-hydroxy-5H-furo-[3,4-e]pyrazolo[3,4-b]pyridin-5-one
10-Chloro-3-ethyl-7,12-dimethyl-7,12-dihydropyrazolo-[4',3':5,6]pyrido[4,3-b][1,5]benzodiazepin-6(3H)-one, said PGE_1 being present in a concentration of from about 10^{-6} molar to about 10^{-9} molar, and said compound being present in a concentration of from about 0.1 mM to about 4 mM.

5. A composition for inhibiting aggregation of human blood platelets which comprises PGE_1 and a member which potentiates the effectiveness of PGE_1, which member is selected from the group consisting of
4-(Butylamino)-1-ethyl-1H-pyrazolo[3,4-b]pyridine-5-carboxylic acid, ethyl ester
4-Chloro-1-ethyl-3-methyl-1H-pyrazolo[3,4-b]pyridine-5-acetonitrile
1-Ethyl-4-(isopropylidenehydrazino)-3-methyl-1H-pyrazolo[3,4-b]pyridine-5-carboxylic acid, ester, or its hydrochloride, hemihydrate
3-Ethyl-7,12-dimethylpyrazolo[4',3':5,6]pyrido[4,3-b]-[1,5]benzodiazepin-6-(3H)-one
3-Ethyl-7,12-dihydro-9-methoxy-7,12-dimethyl-pyrazolo[3',4':2,3]pyrido[4,5-b][1,5]benzodiazepin-6(3H)-one
4-(Butylamino)-1H-pyrazolo[3,4-b]pyridine-6-carboxylic acid, ethyl ester
4-(Butylamino)-1-ethyl-1,7-dihydro-7-hydroxy-5H-furo[3,4-e]pyrazolo[3,4-b]pyridin-5-one
10-Chloro-3-ethyl-7,12-dimethyl-7,12-dihydropyrazolo-[4',3':5,6]pyrido[4,3-b][1,5]benzodiazepin-6(3H)-one, said PGE_1 being present in a concentration of from about 10^{-6} molar to about 10^{-9} molar, and said member being present in a concentration of from about 0.1 mM to about 4 mM

4,051,237

GLYCOPEPTIDE ANTIBIOTICS BU-2231 A AND B AND PROCESS FOR PRODUCING SAME

Hiroshi Kawaguchi, Tokyo; Koji Tomita, Kawasaki; Hiroshi Tsukiura, Mitaka, and Masataka Konishi, Yokohama, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed Aug. 28, 1975, Ser. No. 608,494
Int. Cl.[2] A61K *35/74*
U.S. Cl. 424—117 15 Claims

1. The glycopeptide antitiotic Bu-2231 A or a pharmaceutically acceptable acid addition salt thereof; which antibiotic substance is a base capable of existing in both a copper complex form and a copper-free form; which when subjected to acid hydrolysis gives the amino acids L-threonine, β-amino-β-(4-amino-6-carboxy-5-methylpyrimidine-2-yl)propionic acid, β-hydroxyhistidine, L-β-aminoalanine, 4-amino-3-hyroxy-n-valeric acid, β-lysine and an amino acid exhibiting an ultraviolet absorption maximum at 283 mμ($E_{1cm}^{1\%}$ 280), the terminal amine spermidine and the carbohydrates mannose and gulose; which in the copper complex form (1) is a bluish amorphous solid soluble in water and methanol, slightly soluble in ethanol and practically insoluble in other organic solvents, (2) gives a positive reaction with ninhydrin, (3) has the following elemental analysis (percent): C, 42.66; H, 6.16; N, 15.31; and S, 3.14, (4) shows ultraviolet absorption $\lambda_{MAX}^{H_2O}$ 243 and 291 mμ ($E_{1cm}^{1\%}$ 125 and 98), (5) has a specific rotation of $[\alpha]_D^{23} = +50°$ (c. 0.5, H_2O), and (6) exhibits an Rf of 0.22 in thin layer chromatography using silica gel and methanol—10% ammonium acetate (1:1) and an Rf of 0.05 using silica gel and methanol-10% ammonium acetate-10% ammonium hydroxide (10:9:1), which in the copper-free form (1) is a white amorphous solid, (2) has a specific rotation of $[\alpha]_D^{23} = -21°$ (c. 0.5, H_2O), (3) has the following elemental analysis (percent): C, 45.10; H, 6.51; N, 16.05; and S, 3.55, (4) shows ultraviolet absorption $\lambda_{MAX}^{H_2O}$ 235 and 290 mμ ($E_{1cm}^{1\%}$ sh and 67), and (5) exhibits an Rf of 0.16 in thin layer chromatography using silica gel and methanol — 10% ammonium formate (1:1) and an Rf of 0.04 using silica gel and methanol— 10% ammonium acetate — 10% ammonium hydroxide (10:9:1); which as the copper-free hydrochloride salt when pelleted in potassium bromide has an infrared spectrum substantially as shown in FIG. 1 and when dissolved in deuterium oxide at a concentration of 10% gives an NMR spectrum substantially as shown in FIG. 2; and which in both the copper-free and copper complex forms is effective in inhibiting the growth of bacteria and fungi.

4,051,238

TREATMENT OF GENITAL TRACT DISEASES OF DOMESTIC ANIMALS WITH PROSTAGLANDINS

James H. Sokolowski, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed June 3, 1976, Ser. No. 692,440
Int. Cl.[2] A61K *31/71, 31/215, 31/19*
U.S. Cl. 424—181 20 Claims

1. A method for treating a female domestic animal suffering from a purulent genital tract disease which comprises:
administering to said animal an amount of a domestic animal luteolytic-uterine smooth muscle stimulating prostaglandin (DALUSMUS-PG) effective to cure said disease.

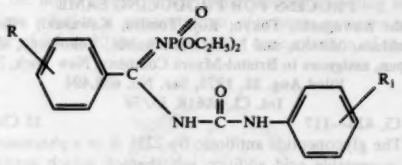
4,051,239

METHOD OF USE AND PROCESS FOR PREPARING PHOSPHOROIMINOBENZOYLUREA INSECTICIDES

Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

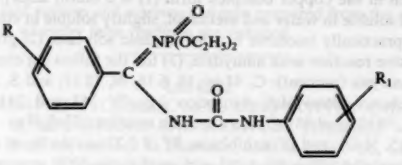
Filed Jan. 26, 1976, Ser. No. 652,039
Int. Cl.[2] A01N *9/36*; C07F *9/24*
U.S. Cl. 424—211 35 Claims

1. A compound having the formula



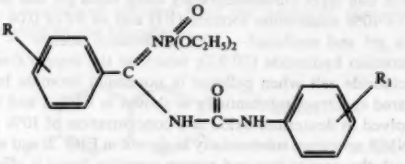
in which R and R_1 are independently selected from the group consisting of hydrogen, 2-halogen, 4-halogen, and 2,6-dihalogen.

14. A method of controlling insects comprising applying to the habitat thereof an insecticidally effective amount of a compound having the formula



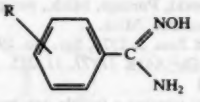
in which R and R_1 are independently selected from the group consisting of hydrogen, 2-halogen, 4-halogen, and 2,6-dihalogen.

30. A process for the manufacture of a compound having the formula

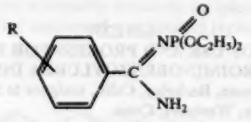


wherein R and R_1 are independently selected from the group consisting of hydrogen, 2-halogen, 4-halogen, and 2,6-dihalogen comprising

a. reacting a compound having the formula

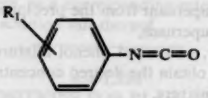


wherein R is defined above with diethyl chlorophosphite and a suitable organic base to produce a compound having the formula



and

b. reacting the product of step (a) with a compound having the formula



wherein R_1 is defined above to produce the end product.

4,051,240

O,S-DIALKYL-O-(4-PHENYLAZOPHENYL)-THIOPHOSPHATES AND PESTICIDAL COMPOSITIONS THEREOF

Alexis A. Oswald, Mountainside, and Paul L. Valint, Woodbridge, both of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

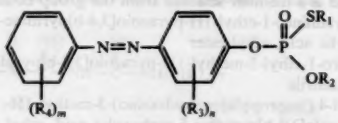
Continuation-in-part of Ser. No. 377,855, July 9, 1973, abandoned. This application Mar. 11, 1976, Ser. No. 666,120

Claims priority, application Switzerland, July 7, 1972, 10210/72; May 11, 1973, 6720/73

Int. Cl.[2] **A01N** *9/36;* **A61K** *31/665, 13/00;* **C07C** *107/06*

U.S. Cl. 424—225 **13 Claims**

1. A compound of the formula



wherein R_1 represents propyl or butyl; R_2 represents methyl or ethyl; each of R_3 and R_4 represents hydrogen, halogen or alkyl having from 1 to 5 carbon atoms; *n* is a number from 1 to 4; and *m* is a number from 1 to 5.

10. A pesticidal composition comprising (1) a pesticidally effective amount of a compound according to claim **1** and (2) a carrier.

4,051,241

METHOD OF TREATING DISEASES BY DAILY ADMINISTRATION OF 6-CHLORO-11β,17α,21-TRIHYDROXYPREGNA-1,4,6-TRIENE-3,20-DIONE

Eugene J. Segre, Los Altos, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 557,137, March 10, 1975, abandoned. This application Aug. 12, 1976, Ser. No. 713,769

Int. Cl.[2] **A61K** *31/56*

U.S. Cl. 424—243 **5 Claims**

1. The method of treating allergic, dermatologic and rheumatic diseases in mammals while, at the same time, lessening the deleterious side effects associated with the hypothalamic-pituitary-adrenal (HPA) axis function during corticosteroid administration, which comprises daily orally administering to said mammal in a single dose in the morning an effective amount of from about 2.5 mg. to about 20 mg. of the compound 6-chloro-11β,17α,21-trihydroxypregna-1,4,6-triene-3,20-dione.

4,051,242

SUBSTITUTED N-ACYL-N''-(3-AMINO-2-CYANOACRYLOYL-)FORMAMIDRAZONES

Kurt Klemm, Allensbach, Germany, and Erhard Langenscheid, late of Constance, Germany, assignors to Byk Gulden Lomberg Chemische Fabrik GmbH, Constance, Germany

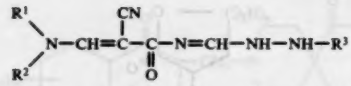
Filed Aug. 22, 1974, Ser. No. 499,522

Claims priority, application Luxembourg, Aug. 27, 1973, 68317

Int. Cl.[2] **C07D** *295/00*

U.S. Cl. 424—246 **27 Claims**

2. A compound of the formula



wherein

R^1 is a member selected from the group consisting of straight- or branch-chained alkyl with from 1 to 7 carbon atoms and cycloalkyl with from 3 to 6 carbon atoms;

R^2 is —H or one of the meanings of R^1; or

R^1 and R^2 together denote (a) pentamethylene or (b) pentamethylene in which at least one methylene is replaced by a member selected from the group consisting of —O—, —S— and —NR^7—;

R^3 is a member selected from the group consisting of CO—R^4, —CO—OR^4 and —CO—$N(R^5)R^6$

R^4 is an $R^5(R^6)$N-substituted or unsubstituted member selected from the group consisting of straight- or branch-chained alkyl with from 1 to 14 carbon atoms, a methylene (other than a methylene) group of which is optionally replaced by an oxygen atom; cycloalkyl with from 3 to 6 carbon atoms; phenyl; phenyl substituted by at least one member selected from the group consisting of straight- or branch-chained alkyl, alkoxy or alkylmercapto having from 1 to 7 carbon atoms, alkoxycarbonyl with from 2 to 5 carbon atoms, halo, trifluoromethyl, nitro and cyano; phenylalkyl, the alkyl of which has from 1 to 6 carbon atoms and the phenyl of which is optionally substituted by at least one member selected from the group consisting of straight- or branch-chained alkyl, alkoxy or alkylmercapto having from 1 to 7 carbon atoms, alkoxycarbonyl with from 2 to 5 carbon atoms, halo, trifluoromethyl, nitro and cyano; or a C_{3-6}—cycloalkyl substituted by —$N(R^5)R^6$;

each of R^5 and R^6 is, independently, a member selected from the group consisting of -H; straight- or branch-chained alkyl with from 1 to 7 carbon atoms, a methylene group of which is optionally replaced by an oxygen atom; and cycloalkyl with from 3 to 6 carbon atoms; or

R^5 and R^6 together denote alkylene with from 2 to 5 carbon atoms or such alkylene in which at least one methylene group is replaced by —O—, —S— or —NR^7—;

R^7 is a member selected from the group consisting of —H; hydroxy-substituted or unsubstituted straight- or branch-chained alkyl with from 1 to 7 carbon atoms; and phenyl optionally substituted by straight- or branch-chained alkyl or alkoxy with from 1 to 7 carbon atoms, halo or trifluoromethyl.

4,051,243

RING SUBSTITUTED PYRAZINO-ISOQUINOLINE DERIVATIVES AND THEIR PREPARATION

Jürgen Seubert; Rolf Pohlke, both of Darmstadt; Herbert Thomas, and Peter Andrews, both of Wuppertal, all of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

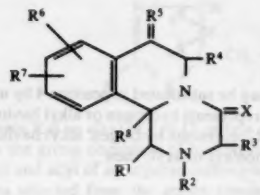
Filed Aug. 26, 1975, Ser. No. 607,810

Claims priority, application Germany, Aug. 28, 1974, 2441261

Int. Cl.[2] C07D *241/36;* **A61K** *31/495*

U.S. Cl. 424—250 **22 Claims**

1. A compound of the formula



wherein R^1 is a hydrogen atom, hydroxy or alkyl; R^2 is

R^3 is a hydrogen atom, alkyl or hydroxyalkyl; R^4 is a hydrogen atom, alkyl or phenyl; R^5 is an oxygen atom, two hydrogen atoms, or a hydrogen atom and one of alkyl, phenyl, halogen atoms, or hydroxy; R^6 and R^7, which can be alike or different, each are a hydrogen atom, a halogen atom, hydroxy, amino, nitro, cyano, alkyl, alkoxy, alkanoyl, monoalkylamino, dialkylamino, alkanoylamino, or benzoyloxy; R^8 is a hydrogen atom or alkyl; R^9 is cycloalkyl or cycloalkenyl of 5 to 7 carbon atoms which is unsubstituted or, substituted by a carbonyl oxygen atom X and Y, which can be the same or different, each is an oxygen or sulfur atom; with the proviso that R^2 is

when R^1 and R^3 to R^8, inclusive, each are hydrogen atoms and X is an oxygen atom alkyl, hydroxyalkyl, alkoxy and alkanoyl being up to 4 carbon atoms.

17. An anthelmintic composition comprising an anthelmintically effective amount per unit dosage of at least one compound of claim **1** in admixture with a pharmaceutically acceptable carrier or in admixture with an animal feed or feed concentrate.

4,051,244

2,4-DIAMINO 5-BROMO 6-CHLORO PYRIMIDINES, PROCESS FOR THEIR PREPARATION AND USE AS PHARMACEUTICALS

Georges Dominique Mattioda, Deuil-la-Barre, and Francois Louis Albert Rocquet, Viarmes, both of France, assignors to Mar-Pha Societe d'Etudes et d'Exploitation de Marques, Paris, France

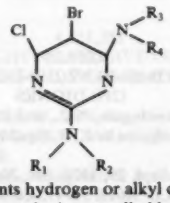
Filed May 20, 1976, Ser. No. 687,972

Claims priority, application France, May 23, 1975, 75.16088

Int. Cl.[2] A61K *31/495, 31/505;* **C07D** *239/00*

U.S. Cl. 424—250 **17 Claims**

1. A compound of the general formula:



in which R_1 represents hydrogen or alkyl containing from 1 to 4 carbons, R_2 represents hydrogen, alkyl having 1 to 8 carbons, dialkylaminoalkyl or aryl, and

is piperazinyl which may be substituted in position 4 by methyl or benzyl, or when R_3 represents hydrogen or alkyl having 1 to 4 carbons, and when R_4 represents hydrogen, alkyl having 1 to 8 carbons, dialkylaminoalkyl or aryl, then

is piperazinyl which may be substituted in position 4 by methyl or benzyl.

15. A method for producing anti-ulcer therapy in a human requiring such therapy which comprises internally administering to said human an amount effective to produce anti-ulcer therapy of a compound of the formula of claim **1.**

4,051,245

PYRAZINE 4-OXIDE DERIVATIVES AND PROCESS FOR THEIR PREPARATION

Vittorio Ambrogi, Bresso, Milan; Willy Logemann, Milan; Marc'Antonio Parenti, Milan, and Raffaele Tommasini, all of Milan,, Italy, assignors to Carlo Erba, S.p.A., Milan, Italy

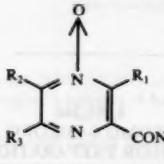
Division of Ser. No. 578,820, May 19, 1975, Pat. No. 4,002,750, which is a continuation of Ser. No. 354,909, April 26, 1973, abandoned. This application Oct. 15, 1976, Ser. No. 732,982

Claims priority, application Italy, Apr. 28, 1972, 23663/72

Int. Cl.[2] A61K *31/495;* **C07D** *241/24*

U.S. Cl. 424—250 **11 Claims**

1. A compound of the formula



wherein at least one of R_1, R_2 and R_3 is C_{1-6} alkyl and the others are hydrogen atoms; each of R^5 and R^6, which may be the same or different, is hydrogen or C_{1-6} alkyl.

8. A pharmaceutical composition consisting essentially of a compound according to claim **1** and a pharmaceutically acceptable carrier or diluent.

4,051,246

2-SUBSTITUTED-1H-BENZ(DE)-ISOQUINOLINE-1,3-(2H)-DIONES

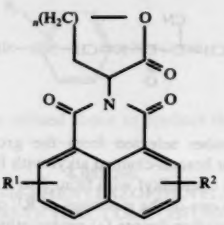
Peter C. Wade, Pennington, N.J., and Berthold Richard Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sept. 29, 1976, Ser. No. 727,836

Int. Cl.[2] A61K *31/47;* **C07D** *405/04*

U.S. Cl. 424—258 **6 Claims**

1. A compound of the formula



wherein R^1 and ^{2} are independently selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, halogen, lower alkylthio, nitro, cyano, and trifluoromethyl; and *n* is 1 or 2.

5. A pharmaceutical composition useful for treating inflammation in a mammalian specie comprising as the active ingredient from about 1 mg./kg. to about 30 mg./kg. of a compound or mixture of compounds of claim **1** and a pharmaceutically acceptable carrier.

4,051,247

METHOD OF USING 7-HYDROXY-BENZO[IJ]QUINOLIZINE-2-CARBOXYLIC ACID DERIVATIVES

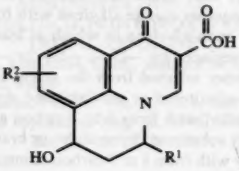
Dietrich Schuppan, St. Paul; John F. Gerster, and Charles M. Leir, both of Woodbury, all of Minn., assignors to Riker Laboratories, Inc., Northridge, Calif.

Division of Ser. No. 567,510, April 14, 1975, Pat. No. 3,985,753. This application Mar. 24, 1976, Ser. No. 669,845

Int. Cl.[2] A61K *31/47*

U.S. Cl. 424—258 **2 Claims**

1. A method for inhibiting the growth of microorganisms which comprises applying to said microorganisms an effective growth-inhibiting amount of a compound of the formula



wherein R^1 is hydrogen, methyl or ethyl; R^2 is methyl, ethyl, halogen, hydroxy, nitro, amino, acetamido or formamido; *n* is zero, one or two, and when *n* is two, R^2 may be methylenedioxy or ethylenedioxy bonded to adjacent carbon atoms; and when R^2 is ethyl, methoxy, nitro, amino, acetamido or formamido, and *n* is two, each R^2 must be different; or a lower alkyl ester or pharmaceutically acceptable salt derivative thereof.

4,051,248

1,3,8-TRIAZASPIRO(4.5)DECAN-4-ONE DERIVATIVES

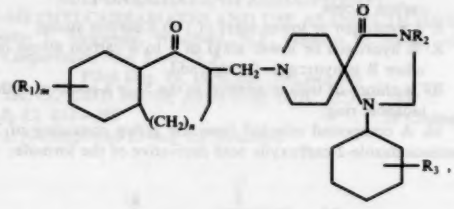
B. Richard Vogt, Yardley, Pa., and David A. Cullison, Princeton, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

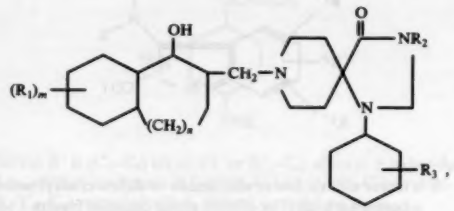
Continuation-in-part of Ser. No. 595,947, July 14, 1975, abandoned. This application May 20, 1976, Ser. No. 688,438

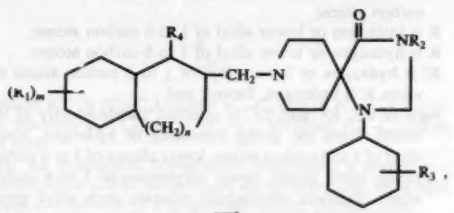
Int. Cl.[2] C07D *471/10;* **A61K** *31/445*

U.S. Cl. 424—267 **16 Claims**

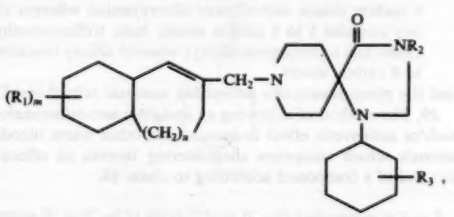
1. A compound having the formula







and



or a pharmaceutically acceptable salt thereof, wherein R_1 is hydrogen, halogen, hydroxy, alkanoyloxy, alkoxy, alkylthia, alkyl or trifluoromethyl; R_2 is hydrogen, alkyl or alkenyl having 2 to 4 carbon atoms; R_3 is hydrogen, halogen or alkyl; R_4 is formyloxy or alkanoyloxy; *m* is 1 or 2; and *n* is 0, 1 or 2; wherein the terms alkyl, alkoxy and alkylthio refer to groups having 1 to 10 carbon atoms and the term alkanoyloxy refers to groups having 2 to 11 carbon atoms.

15. A neuroleptic composition comprising a therapeutic amount of a compound as defined in claim **1** and a pharmaceutically acceptable carrier thereof.

4,051,249

SALTS OF 2-ALKYLTHIAZOLE-5-METHANOL DERIVATIVES

Michel Hardy, Maisons-Alfort, and Daniel Humbert, Paris, both of France, assignors to Roussel-UCLAF, Paris, France

Filed Jan. 19, 1976, Ser. No. 650,291

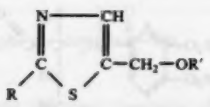
Claims priority, application France, Jan. 22, 1975, 75.01972

The portion of the term of this patent subsequent to May 18, 1993, has been disclaimed.

Int. Cl.² C07D *277/24*

U.S. Cl. 424—270 **9 Claims**

1. The non-toxic, pharmaceutically acceptable acid addition salts of a compound of the formula



wherein R is an alkyl of 2 to 12 carbon atoms and R′ is selected from the group consisting of hydrogen, alkyl of 1 to 8 carbon atoms and acyl of an organic carboxylic acid of 1 to 12 carbon atoms selected from the group consisting of alkanoic acids, cycloalkylcarboxylic acids, cycloalkylalkanoic acids, benzoic acid and phenylalkanoic acids.

5. An hypolipemiant and vasodilatatory composition comprising an hypolipemiantly and vasodialatatorily effective amount of at least one acid addition salt of claim **1** and an inert pharmaceutical carrier.

7. A method of inducing hypolipemic and vasodilatatory activity in warm-blooded animals comprising administering to warm-blooded animals an hypolipemically and vasodilatatorily effective amount of at least one salt of claim **1**.

4,051,250

ANTIINFLAMMATORY AZOLE DERIVATIVES

Johann Dahm, Eschollbrucken; Joachim Borck, Darmstadt; Albrecht Wild, Darmstadt, and Jan Willem Hovy, Darmstadt, all of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

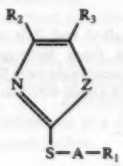
Division of Ser. No. 260,307, June 6, 1972, Pat. No. 3,933,840. This application Oct. 21, 1975, Ser. No. 624,447

Claims priority, application Germany, June 11, 1971, 2129012

Int. Cl.² A61K *31/42, 31/425*

U.S. Cl. 424—272 **19 Claims**

1. A pharmaceutical composition comprising, in admixture with a solid, liquid or semiliquid pharmaceutically acceptable carrier, an antinflammatorily effective amount per unit dosage of a compound of the formula



wherein R_1 is carboxyl, a physiologically acceptable C_{1-12} alkyl ester thereof, $-CONH_2$ or $-CN$; R_2 and R_3 each are phenyl or phenyl mono- or di-substituted by at least one member selected from the group consisting of alkyl, alkoxy alkylmercapto, monoalkylamino, dialkylamino or alkanoylamino wherein the alkyl, alkoxy and alkanoyl are each of up to 4 carbon atoms, F, Cl, Br, I, CF_3, OH, methylenedioxy, NH_2 and NO_2; A is C_nH_{2n} wherein n is an integer from 1 to 10 inclusive; and Z is O or S, or a physiologically acceptable salt thereof.

4,051,251

NOVEL ANTI-HYPERTENSIVE COMPOSITIONS

Clement A. Stone, Blue Bell, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

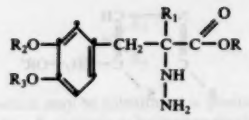
Filed Feb. 13, 1976, Ser. No. 657,824

Int. Cl.² A61K *31/415, 31/24, 31/195*

U.S. Cl. 424—273 R **7 Claims**

1. A pharmaceutical composition for treating hypertension comprising

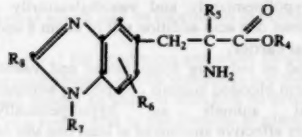
A. a decarboxylase inhibitor compound having the formula



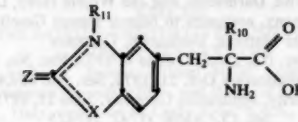
wherein R, R_1, R_2 and R_3 are independently selected from hydrogen and C_1–C_4 alkyl, and pharmaceutically acceptable salts thereof and

B. an arylalanine selected from compounds having the formulae:

(I)



wherein R_4, R_5, R_7 and R_8 are independently selected from hydrogen and C_1–C_4 alkyl, R_6 is selected from the group consisting of hydrogen, halogen, hydroxy and C_1–C_4 alkyl, and pharmaceutically acceptable salts thereof, and



wherein R_9, R_{10}, and R_{11} are independently selected from hydrogen and C_1–C_4 alkyl, X is

wherein R_{12} is hydrogen or C_1–C_4 alkyl and Z is =O or —O—R_{13} wherein R_{13} is selected from hydrogen or C_1–C_4 alkly, and pharmaceutically acceptable salts thereof wherein the weight ratio of (A):(B) is about 400:1 to about 1:4.

4,051,252

3-AMINOINDAZOLE-1 AND 2-CARBOXYLIC ACID DERIVATIVES

Karl Heinrich Mayer; Siegfried Petersen; Erich Klauke, all of Leverkusen; Friedrich Hoffmeister, and Wolfgang Wuttke, both of Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

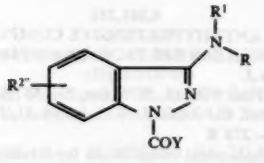
Filed Nov. 24, 1975, Ser. No. 634,914

Claims priority, application Germany, Dec. 13, 1974, 2458965

Int. Cl.² A61K *31/415;* **C07D** *231/56*

U.S. Cl. 424—273 P **30 Claims**

1. A compound selected from the group consisting of a 3-aminoindazole-1-carboxylic acid derivative of the formula:



wherein

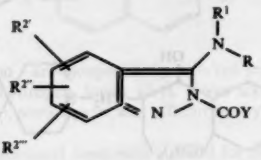
Y is lower alkoxy, lower alkylamino or di(lower alkyl)amino wherein each alkyl or alkoxy group contains from 1 to 6 carbon atoms;

R is hydrogen or lower alkyl of 1 to 6 carbon atoms;

R^1 is hydrogen or lower alkyl of 1 to 6 carbon atoms or, when R is hydrogen, formyl; and

$R^{2'''}$ is chloro or trifluoromethyl in the 5- or 6-position of the indazole ring.

16. A compound selected from the group consisting of 3-aminoindazole-2-carboxylic acid derivative of the formula:



wherein

Y is lower alkoxy, lower alkylamino or di(lower alkyl)amino wherein each alkyl or alkoxy group contains fromm 1 to 6 carbon atoms;

R is hydrogen or lower alkyl of 1 to 6 carbon atoms;

R is hydrogen or lower alkyl of 1 to 6 carbon atoms;

R^1 is hydrogen or lower alkyl of 1 to 6 carbon atoms or, when R is hydrogen, formyl; and

each of $R^{2'}$, $R^{2''}$ and $R^{2'''}$ is selected, independently of the others, from the group consisting of hydrogen, lower alkyl of 1 to 6 carbon atoms, lower alkoxy of 1 to 6 carbon atoms, nitro, amino, lower alkylamino of 1 to 6 carbon atoms, di(lower alkyl)amino wherein each alkyl group contains 1 to 6 carbon atoms, lower alkanoylamino of 1 to 6 carbon atoms, carbo(lower alkoxy)amino wherein alkoxy contains 1 to 6 carbon atoms, halo, trifluoromethyl, cyano and carbo(lower alkoxy) wherein alkoxy contains 1 to 6 carbon atoms,

and the pharmaceutically acceptable nontoxic salts thereof.

29. The method of achieving an analgesic anti-inflammatory and/or antipyretic effect in humans and other warm blooded animals which comprises administering thereto an effective amount of a compound according to claim **16.**

4,051,253

MICROBICIDAL NITROFURYL COMPOUNDS

Helmut Hein; Rosmarie Hermann geb Gleissner, and Hartmann Schaefer, all of Constance, Germany, assignors to Byk Gulden Lomberg Chemische Fabrik GmbH, Constance, Germany

Filed Oct. 10, 1975, Ser. No. 621,529

Claims priority, application Luxembourg, Oct. 15, 1974, 71111

Int. Cl.² A01N *9/28;* **C07D** *307/34*

U.S. Cl. 424—285 **18 Claims**

1. A microbicidal 2-{[o-(lower)alkylaroylhydrazone]propen-1-yl}-5-nitrofuran which is essentially non-toxic to mammals and birds upon administration thereto in microbicidally-effective doses and the aroyl of which comprises one ring, which is a 6-membered carbocyclic ring, or a mixture of such microbicidal nitrofurans.

13. A therapeutically-active and pharmaceutically-acceptable medicament comprising a pharmaceutical vehicle and havingg a microbicidally-effective concentration of nitrofuryl microbicide according to claim **1.**

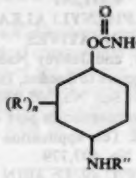
4,051,254

SULFONAMIDO-AND AMIDOPHENYL N-METHYLCARBAMATES AND USE AS INSECTICIDES

Lester L. Maravetz, Westfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 19, 1975, Ser. No. 642,265
Int. Cl.[2] C07D *307/68;* A01N *9/20;* C07C *125/06, 143/75*
U.S. Cl. 424—285 39 Claims

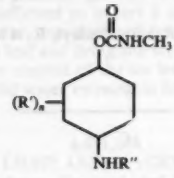
1. A compound having the structure:



wherein R′ is (C_1–C_3) alkyl, Cl, or (C_1–C_4) alkoxy; *n* is 1 to 3; R″ is —$SO_2R^{\prime}$ wherein R″′ is (C_1-C_4) alkyl, (C_3-C_6) cycloalkyl, (C_1–C_4) monohaloalkyl, phenyl, or tolyl or R″ is

wherein R″″ is (C_1–C_4) alkoxy (C_1–C_4) alkyl, (C_1–C_4) haloalkyl, phenoxy (C_1–C_4) alkyl, (C_1–C_4) alkylthio (C_1–C_4) alkyl, and furyl.

14. An insecticidal composition comprising a carrier and between about 0.0001 percent and about 80 percent, by weight of said composition of a compound having the structure:



wherein R′ is (C_1–C_3) alkyl, Cl, or (C_1–C_4) alkoxy; *n* is 1 to 3; R″ is —$SO_2R^{\prime}$, wherein R″′ is (C_1–C_4) alkyl, (C_3–C_6) cycloalkyl, (C_1–C_4) monohaloalkyl, phenyl, or tolyl or R″ is

wherein R″″ is (C_1–C_4) alkoxy (C_1–C_4) alkyl, (C_1–C_4) haloalkyl, phenoxy (C_1–C_4) alkyl, (C_1–C_4) alkylthio (C_1–C_4) alkyl, and furyl.

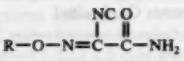
4,051,255

2-CYANO-2-HYDROXYIMINOACETAMIDES AS PLANT DISEASE CONTROL AGENTS

Sidney Hayes Davidson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 453,392, March 21, 1974, Pat. No. 3,954,992, which is a continuation-in-part of Ser. No. 375,376, July 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 330,457, Feb. 7, 1973, abandoned, which is a continuation-in-part of Ser. No. 234,997, March 15, 1972, abandoned. This application Feb. 6, 1976, Ser. No. 655,956
Int. Cl.[2] A01N *9/20*
U.S. Cl. 424—289 1 Claim

1. A method for controlling fungus diseases in plants consisting essentially of applying to the plants a fungicidally effective amount of a compound of the formula



wherein

R is selected from the group consisting of iron, zinc and manganese.

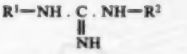
4,051,256

GUANIDINE DERIVATIVES

Douglas Lintin Swallow, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Sept. 19, 1976, Ser. No. 706,554
Int. Cl.[2] C07C *129/12*
U.S. Cl. 424—304 10 Claims

1. A compound of the formula:



wherein R^1 is selected from the group consisting of adamantyl, bicyclo[2,2,1]heptanyl, bicyclo[2,2,1]hept-5-enyl, tricyclo[2,2,1,$0^{2,6}$]heptanyl and tetracyclo[4,3,0,$0^{2,4}$,$0^{3,7}$]-nonanyl and R^2 is selected from the group consisting of phenyl optionally substituted by a substituent selected from the group consisting of halogen, alkyl and cyanoalkyl of 1 to 6 carbons, alkoxycarbonyl of 2 to 6 carbons and amino, and the pharmaceutically-acceptable acid-addition salts thereof.

4,051,257

TOPICAL VETERINARY DERMATOLOGICAL MEDICAMENT

Carl Jelenko, III, Medical College of Ga., Augusta, Ga. 30902

Continuation-in-part of Ser. No. 432,216, Jan. 10, 1974, Pat. No. 3,920,848. This application Nov. 3, 1975, Ser. No. 628,143
Int. Cl.[2] A61K *31/23*
U.S. Cl. 424—312 5 Claims

1. A method of relieving non-bacterial dermatoses selected from one member of the group consisting of contact dermatitis, licking disease, erythema, and pruritis in verterinary animals which consists of applying to such affected dermatoses on an animal an effective amount of ethyl-cis,cis-(9,12)-octadecadienoate in a dosage of one drop to cover an area up to 36 square inches.

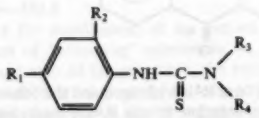
4,051,258

THIOUREA DERIVATIVES FOR COMBATTING MITES AND TICKS

Dieter Durr, Bottmingen, and Marcus von Orelli, Munchenstein, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 379,536, July 6, 1973, Pat. No. 3,927,087. This application Oct. 20, 1975, Ser. No. 623,875
Claims priority, application Switzerland, July 24, 1972, 11003/72
Int. Cl.[2] A01N *9/12*
U.S. Cl. 424—322 11 Claims

1. A method for combatting mites and ticks which comprises applying thereto a pesticidally effective amount of a compound of the formula



wherein R_1 represents halogen or methyl, R_2 represents C_1–C_4 alkyl, and R_4 represents C_2–C_5 alkyl.

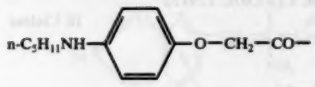
4,051,259

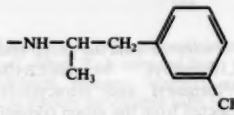
PHENOXYACETIC ACID AMIDE

André Buzas, Bievres, and Jacques Bruneau, Neuilly-sur-Seine, both of France, assignors to Les Laboratoires Bruneau & Cie, France

Filed Apr. 2, 1976, Ser. No. 672,967
Claims priority, application France, Apr. 8, 1975, 75.10890
Int. Cl.[2] A61K *31/165;* **C07C** *103/75*
U.S. Cl. 424—324 **3 Claims**

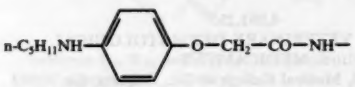
1. Phenoxyacetic acid derivative of the formula:

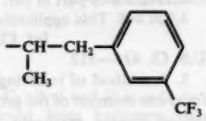




and its pharmaceutically acceptable acid addition salts.

2. A method of inducing anorexia in man which comprises orally administering a compound of the formula





or a pharmaceutically acceptable acid addition salt thereof to a patient in an amount sufficient to induce anorexia.

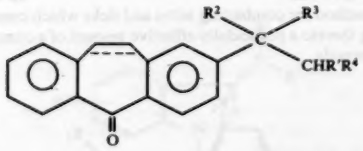
4,051,260

2-SUBSTITUTED-5-OXO-5H-DIBENZO[A,D]CYCLOHEPTENES, AND DERIVATIVES THEREOF, AND METHODS AND COMPOSITIONS FOR THE USE THEREOF

Peter H. Nelson, and Karl G. Untch, both of Los Altos, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 572,477, April 28, 1975, Pat. No. 3,975,540. This application Apr. 8, 1976, Ser. No. 675,095
Int. Cl.[2] C07C *49/76;* **A01N** *9/24*
U.S. Cl. 424—331 **26 Claims**

1. A compound selected from the group of compounds represented by the formula:



where one of R^2 and R^3 is hydrogen and the other is hydrogen, methyl, ethyl or together R^2 and R^3 are methylene; R′ and R^4 taken together are =O and the dotted line refers to an optional, additional bond between the carbon atoms at the 10- and 11-positions.

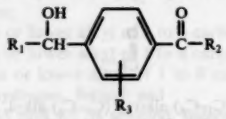
4,051,261

1-(P-ALKANOYLPHENYL) ALKANOLS AND DERIVATIVES

Paul L. Anderson, Dover, and Jeffrey Nadelson, Lake Parsippany, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 505,936, Sept. 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 432,832, Jan. 14, 1974, abandoned. This application Aug. 26, 1975, Ser. No. 607,779
Int. Cl.[2] C07C *49/82;* **A01N** *9/24*
U.S. Cl. 424—331 **10 Claims**

1. A compound of the formula



where

R_1 is t-butyl or cycloalkyl having 3 to 6 carbon atoms, and

R_2 is lower alkyl having 1 to 4 carbon atoms or lower alkenyl having 3 to 5 carbon atoms, and

R_3 is hydrogen or halo having an aomic weight of about 19 to 80,

provided that when R_1 is cycloalkyl, R_2 is lower alkyl.

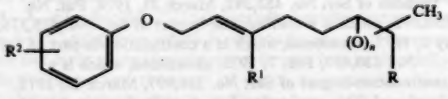
4,051,262

CERTAIN GERANYL PHENYL ETHERS AND THEIR EPOXIDES AND THEIR USE IN CONTROLLING INSECTS

Ferenc M. Pallos, Pleasant Hill; Hwalin Lee, Palo Alto, and Julius J. Menn, Saratoga, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 578,580, May 19, 1975, Pat. No. 3,970,758, which is a division of Ser. No. 856,140, Sept. 8, 1969, Pat. No. 3,907,783, which is a continuation-in-part of Ser. No. 815,229, April 10, 1969, abandoned. This application May 10, 1976, Ser. No. 684,710
Int. Cl.[2] A01N *9/12, 9/24*
U.S. Cl. 424—337 **1 Claim**

1. A method of controlling *Tenebrio molitor* comprising applying thereto at any stage of their development a metamorphosis hindering amount of a compound of the formula:



in which R and R^1 are independently methyl or ethyl; *n* is the integer zero; R^2 is hydrogen; halogen; lower alkyl having 1 to 6 carbon atoms; lower alkoxy having 1 to 4 carbon atoms; lower alkenyl having 2 to 6 carbon atoms; lower alkylthio having 1 to 5 carbon atoms, or nitro.

4,051,263

DERIVATIVES OF 1,2-DIPHENYL-ETHANE

John Cameron Turner, West Wickham, and Rosalind Po-Kuen Chan, London, both of England, assignors to Biorex Laboratories Limited, London, England

Continuation of Ser. No. 116,274, Feb. 17, 1971, abandoned. This application Mar. 27, 1975, Ser. No. 563,119

Claims priority, application United Kingdom, Mar. 16, 1970, 12554/70

Int. Cl.[2] A61K *31/055*; C07C *39/16, 39/24*

U.S. Cl. 424—347 3 Claims

1. 3,3′-Difluoro-4,4′-dihydroxy-α-ethyl-α′-methyl-dibenzyl.

2. A pharmaceutical composition for the treatment of hypertrophied conditions of the prostate, said composition suitable for oral administration which comprises an effective amount of 3,3′-difluoro-4,4′-dihydroxy-α-ethyl-α′-methyl-dibenzyl, in admixture with a solid or liquid pharmaceutical diluent or carrier.

4,051,264

COLD WATER EXTRACTABLE TEA LEAF AND PROCESS

Gary Warner Sanderson, Englewood; Andrew Charles Hoefler, Cresskill; Harold Nathaniel Graham, Englewood, all of N.J., and Philip Coggon, Orangeburg, N.Y., assignors to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.

Continuation of Ser. No. 610,647, Sept. 5, 1975, abandoned, which is a continuation-in-part of Ser. No. 559,232, March 17, 1975, abandoned. This application Nov. 16, 1976, Ser. No. 742,281

Int. Cl.[2] A23F *3/00*

U.S. Cl. 426—52 16 Claims

14. A cold water extractable fired black tea leaf prepared by comminuting freshly harvested green tea leaf, treating the comminuted fresh green tea leaf with tannase at a temperature and for a time sufficient to impart a substantial cold water extractability to the manufactured tea leaf, fermenting the treated green tea leaf and firing the fermented tea leaf to reduce the moisture content of the tea leaf to below about 5% and produce a cold water extractable fired black tea leaf.

4,051,265

PACKAGE FOR LIGHT AND OXYGEN SENSITIVE FOOD

Gerald S. Kirshenbaum, Fanwood, and Elliot A. Vogelfanger, Edison, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 513,688, Oct. 10, 1974, abandoned. This application Aug. 26, 1976, Ser. No. 717,840

Int. Cl.[2] B65B *25/00*

U.S. Cl. 426—107 11 Claims

1. A package comprising:

a blow molded thermoplastic container defining a volume filled with a liquid food sensitive to light and oxygen, said container providing means for ingress and egress of said liquid, said thermoplastic container including titanium dioxide, present in a concentration of at least 0.5% by weight, based on the total weight of the container which essentially bars the transmittance therethrough of light having a wavelength in the range of between about 3500 and 5500 Angstrom units; and

an overwrap of polyethylene terephthalate film having a thickness of about 0.5 to 2.5 mils and disposed over said thermoplastic container, completely enclosing it.

4,051,266

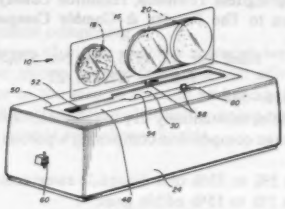
PACKAGE FOR HEATING FOOD IN ELECTRICAL APPLIANCES

Costas E. Goltsos, Weston, Mass., assignor to Teckton, Inc., Wellesley, Mass.

Division of Ser. No. 417,907, Nov. 21, 1973, Pat. No. 3,941,044. This application Dec. 4, 1975, Ser. No. 637,700

Int. Cl.[2] B65B *25/22*

U.S. Cl. 426—120 2 Claims



1. A food package comprising:

a sealed envelope formed from plastic sheet material transparent to radiation of a character which is adapted to heat condition foods and capable of withstanding temperatures produced by such heat conditioning, said envelope being formed to define at least two distinct sealed compartments;

a multi-component food product comprised of different food components with a component disposed in each compartment wherein; at least two of said food components each require different degrees of heating in order to heat-condition said food product for serving; said food components being adapted for serving as a unitary food product;

said envelope being of a generally elongate configuration and having said compartments formed therein in longitudinally spaced side-by-side relation, at least one of said compartments being of a thickness which is less than that of the other compartment in said package, said compartments being arranged in the package as to be disposed asymmetrically with respect to a transverse center line of said envelope which is orthogonal to the longitudinal center line of said envelope, and said compartments disposed in central registry with the longitudinal center line of said envelope and symmetrical about a cross-sectional plane extending through the longitudinal center line of the envelope.

4,051,267

PROCESS FOR STABILIZING TEA EXTRACT AND PRODUCT

Herman Jongeling, Leusden, Netherlands, assignor to D.E.J. International Research Company B.V., Utrecht, Netherlands

Continuation of Ser. No. 613,447, Sept. 15, 1975, abandoned. This application Jan. 26, 1977, Ser. No. 762,743

Claims priority, application United Kingdom, Sept. 17, 1974, 40365/74

Int. Cl.[2] A23F *3/00*

U.S. Cl. 426—330.3 5 Claims

1. Process for stabilization of tea extract for preventing sedimentation of "creaming" substances on chilling and/or during storage at cold temperatures, the extract being stabilized without substantial viscosity increase so that it is capable of being used in automatic dispensing machines without impairing the accuracy of dosing, the process avoiding removal

of creaming substances, or changing the natural pH of the extract, the process consisting essentially of:

a. extracting a tea extract from tea with hot water; and

b. mixing the tea extract at a temperature of at least about 60° C for at least about 1½ minutes with an effective stabilizing amount of carragheenan for preventing creaming on cooling of either the extract or a diluted tea drink made therefrom and also effective to provide an extract that is stable without substantial increase in viscosity.

4,051,268

DRY LOW CALORIE BEVERAGE CRYSTALS

Philip John Shires, Mount Healthy, and Timothy James Kennedy, Springfield Township, Hamilton County, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 21, 1975, Ser. No. 570,332
Int. Cl.² A23L *1/22*
U.S. Cl. 426—548 **14 Claims**

1. A stable, substantially dry crystalline, rapidly dissolvable diet beverage composition comprising a porous uniform matrix of

a. from 5% to 55% of a dipeptide sweetener;

b. from 1% to 15% edible gum;

c. from 7% to 30% of a crystalline sugar carrier; and

d. from 25% to 85% of a beverage flavorant; and

wherein said substantially dry crystalline rapidly dissolvable diet beverage composition is made from a process which comprises:

e. forming a dry mixture of a dipeptide sweetener, a crystalline sugar carrier, and a water-soluble, edible gum;

f. forming a homogeneous slurry by uniformly mixing said dry mixture with a liquid flavorant, thereby to provide a slurry comprising by weight of from 35% to 70% of said flavorant, 2% to 45% of said dipetide sweetener, 5% to 30% of said crystalline sugar carrier and 1% to 15% of said watersoluble, edible gum; and wherein said homogeneous slurry has a total solids content of about 50% to about 75%;

g. drying said homogeneous slurry in such manner as to provide a stable, porous, substantially dry, and rapidly dissolving diet beverage crystalline matrix.

4,051,269

LOW CALORIE, HIGH PROTEIN TABLESPREADS FROM SWEET MILK AND THEIR PRODUCTION

Olof Bo Sven Strinning, Saltsjobaden, Sweden, assignor to Mjolkcentralen, Ekonomisk Forening, Stockholm, Sweden

Continuation-in-part of Ser. No. 608,700, Aug. 28, 1975, abandoned, and Ser. No. 673,059, April 2, 1976, abandoned. This application Jan. 14, 1977, Ser. No. 759,471
Claims priority, application Sweden, Aug. 29, 1974, 7410940
Int. Cl.² A23D *3/00*
U.S. Cl. 426—603 **10 Claims**

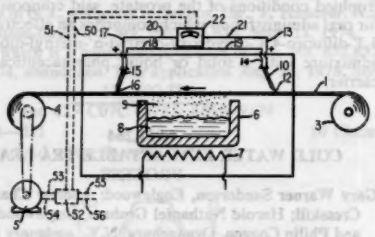
1. A method for the production of low calorie, high protein edible water-in-oil emulsion tablespreads from sweet milk proteins, which comprises heating to an aqueous concentrate of sweet milk proteins at 70°–105° C. for a period of time that the proteins thereof are denatured in such a way that both its water holding and its emulsifying properties are increased, said concentrate is obtained by membrane filtration of at least the aqueous phase of sweet milk and having a protein content of about 9–24% by weight and a pH value of at least 5,1; cooling the heated protein concentrate to 55°–38° C; introducing the cooled protein solution into an edible oil and forming a 65–35% aqueous phase, 35–65% oil phase water-in-oil emulsion; and then further cooling the emulsion to a temperature at which it is storable to form a margarine-like tablespread.

4,051,270

METHOD OF MEASURING VAPOR DEPOSITED COATING THICKNESS

John F. Butler, Bethel Park, Pa., assignor to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 813,790, Feb. 18, 1969, abandoned, which is a continuation-in-part of Ser. No. 540,705, April 6, 1966, abandoned. This application Oct. 10, 1972, Ser. No. 296,419
Int. Cl.² C23C *13/00, 13/02*
U.S. Cl. 427—8 **13 Claims**



1. A method of vacuum vapor coating a thin metal substrate in strip form with a metal coating of a desired thickness without heating the substrate over about 1000° F comprising:

measuring the temperature of the substrate immediately before coating;

moving the substrate past a source which contains a pool of liquid coating metal which gives off metal vapor at its surface so as to condense coating metal on the substrate, to form a coating of said metal on said substrate, to supply heat to the substrate, and to increase the temperature of the substrate;

immediately thereafter measuring the increase in temperature of the substrate resulting therefrom under conditions where temperature equilibrium through the substrate thickness is reached in less than 0.1 second and substrate heat loss is negligible;

adjusting coating conditions to obtain the desired metal coating thickness in accordance with the equation,

$$t_c \frac{C_M (T_f - T_o)\, \rho_M\, t_M}{\rho_c [C_k + C_c (T_c - T_f)]}$$

t_c is the thickness of the coating in mils,

C_M is the average heat capacity of the substrate for temperatures between T_o and T_f in BTU's per pound per degree F.,

T_f is the final temperature of the substrate immediately after coating in degrees F.,

T_o is the temperature of the substrate immediately before coating in degrees F.,

ρ_M is the density of the substrate in pounds per cubic inch,

t_M is the thickness of the substrate in mils, ρ_c is the density of the coatng metal in pounds per cubic inch,

C_k is the heat of condensation of the coating metal at T_c in BTU's per pound,

C_c is the average heat capacity of the solid coating metal for temperatures between T_f and T_o in BTU's per pound per degree F., and

T_c is the temperature of condensation of the coating metal in degrees F.; and

measuring the increase in temperature of the substrate caused by radiation from the vapor source, subtracting said temperature increase caused by radiation from T_f, as defined above, to obtain a value, and using said value for T_f in the equation.

4,051,271
METHOD FOR FORMING IMAGES BY IRRADIATION OF ELECTRON RAYS AND RESIST COMPOSITIONS UTILIZABLE THEREFOR

Shoei Fujishige, Yokohama, Japan, assignor to Director-General of the Agency of Industrial Science and Technology, Japan

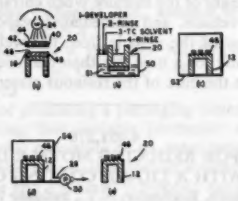
Filed Mar. 18, 1976, Ser. No. 668,046
Claims priority, application Japan, June 30, 1975, 50-81323
Int. Cl.² B05D 3/06
U.S. Cl. 427—43 **11 Claims**

1. A method for forming images characterized by applying onto a substrate a thin film of a stereocomplex composed of syndiotactic poly(methyl methacrylate) obtained by radical polymerization and poly(methyl methacrylate) obtained by anionic polymerization and containing the isotactic structure, exposing said thin film to irradiation by electron rays through an original to effect depolymerization of the polymer in the exposed areas and thereafter washing off the depolymerized substance with an organic solvent.

4,051,272
LOW-TEMPERATURE THERMIONIC EMITTER

Richard W. Remington, San Carlos, Calif., assignor to Electron Emission Systems, Tucson, Ariz.

Continuation of Ser. No. 129,443, March 30, 1971, abandoned. This application June 13, 1975, Ser. No. 586,592
Int. Cl.² B05D 5/12
U.S. Cl. 427—54 **8 Claims**



1. A method of forming a low temperature thermionic emitter comprising the steps of:

a. forming a layer comprising a mixture of a pyrolitically decomposable alkaline earth oxide precursor dispersed in an actinically hardenable organic binder photoresist resin on the surface of a conductive substrate, said dispersion containing from 15% to 75% by weight of said precursor based on resin solids;

b. exposing said layer to actinic radiation to harden said binder; and

c. heating said layer to a temperature sufficiently high to pyrolitically decompose said precursor and volatize said binder, said precursor being primarily reduced by the carbon remaining in said layer after said binder has volatized, to form a porous alkaline earth oxide containing coating on said surface.

4,051,273
FIELD EFFECT TRANSISTOR STRUCTURE AND METHOD OF MAKING SAME

Shakir Ahmed Abbas, Wappingers Falls, and Robert Charles Dockerty, Highland, both of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Nov. 26, 1975, Ser. No. 635,523
Int. Cl.² B05D 5/12
U.S. Cl. 427—86 **10 Claims**

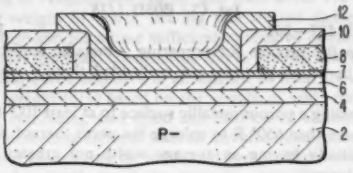
1. In the method of fabricating a field effect transistor which includes the steps of:

forming a composite silicon dioxide-silicon nitride insulating layer over the active regions of said field effect transistor, said active regions including a channel region disposed between source and drain regions;

depositing a field shield electrode of polycrystalline silicon over a portion of said composite layer;

forming a conductive silicon dioxide layer over the upper and sidewall surfaces of said polycrystalline silicon layer; and

depositing a gate electrode over said composite layer;



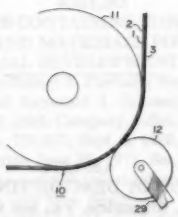
the improvement comprising:

forming a layer of highly resistive material between said conductive silicon dioxide layer and said silicon nitride layer prior to the step of forming said field shield electrode; said material selected from the group consisting of silicon oxynitride and silicon dioxide.

4,051,274
METHOD FOR COATING THE PHOTORESIST ONTO A BELT-LIKE MATERIAL COMPRISING A PERFORATED CARRIER AND METALLIC FOIL

Kazuo Hata, Kameoka, and Sumio Mitani, Hikone, both of Japan, assignors to Dainippon Screen Seizo Kabushiki-Kaisha, Kyoto, Japan

Filed Mar. 31, 1976, Ser. No. 672,329
Claims priority, application Japan, Apr. 3, 1975, 50-39797; Apr. 15, 1975, 50-44757
Int. Cl.² B05C 1/08
U.S. Cl. 427—172 **6 Claims**



1. In a method for uniformly coating a photoresist by roller coating means utilizing a back-up roller, a coating roller or the like onto a belt-like material consisting of a perforated carrier having longitudinally spaced device holes or apertures and a metallic foil laminated on said perforated carrier, said method comprising:

winding said belt-like material around said back-up roller in such a manner that said perforated carrier directly contacts the outer surface of the back-up roller and a slight tension is produced on the metallic foil, and

making said coating roller directly contact the surfaces of the metallic foil of the belt-like material at a portion where the belt-like material is wound around the back-up roller and thereby preventing said belt-like material from being depressed adjacent to said device holes or aperatures during the coating process.

4,051,275

EMBEDDING AND COMPACTING PARTICLES IN POROUS SURFACES

Clarence W. Forestek, c/o The Forester Plating & Manufacturing Co. 9607 Quincy Ave., Cleveland, Ohio 44106

Continuation-in-part of Ser. No. 481,703, June 21, 1974, abandoned. This application Mar. 3, 1976, Ser. No. 663,458

Int. Cl.[2] B05D *1/38*

U.S. Cl. 427—201 16 Claims

1. In the process for preparing a metallic surface having pores in which particles are embedded therein which comprises:

a. heating a porous metallic surface to at least 100° F and not more than 650° F to enlarge the pores thereof, said pores initially having an average width not greater than 100 microns;

b. promptly thereafter depositing finely divided particles having an average size no greater than 50 microns onto said heated surface and working said particles into said pores, said particles being at a temperature at least 100° F below the temperature of said heated surface and being selected from the class consisting of perfluorocarbon polymers, elemental metals, metal oxides, metal nitrides, metal carbides and metal disulfides; and

c. permitting said surface and particles to reach room temperature thereby to lock said particles into said pores;

the improvement comprising:

d. subjecting a surface produced according to steps (a), (b) and (c) to a fluid stream having finely divided solid particles suspended therein at a pressure of 30–120 psi for a sufficient period to compact the embedded particles, said suspended particles having an average size no greater than 50 microns;

e. thereafter heating said surface to a temperature of at least 100° F.

f. promptly thereafter depositing additional finely divided particles similar to those already embedded in said pores onto said heated surface and working said particles into said pores, said particles being at a temperature at least 100° F below the temperature of said heated surface; and

g. permitting said surface and particles to reach temperature equilibrium, thereby to lock said additional particles into said pores.

4,051,276

METHOD OF DEACIDIFYING PAPER

John C. Williams, Alexandria, Va., and George B. Kelly, Jr., Gaithersburg, Md., assignors to The United States Government as represented by the Librarian of Congress, Washington, D.C.

Division of Ser. No. 536,125, Dec. 24, 1974, Pat. No. 3,969,549. This application Feb. 23, 1976, Ser. No. 660,286

Int. Cl.[2] C23C *11/00, 13/00;* B05D *3/02*

U.S. Cl. 427—248 C 4 Claims

1. A method of deacidifying paper having a cellulosic base comprising impregnating said paper with a solution of an organo-metallic compound capable of being rapidly hydrolyzed to an alkaline material wherein said compound is selected from the group consisting of lower alkyl compounds of lithium, aluminum, magnesium, gallium, zinc, and mixtures thereof, and wherein the solvent for said compound is an organic liquid, unreactive with said organo-metallic compound and non-destructive to inks used on printed matter, and subsequently hydrolyzing said organo-metallic compound to an alkaline material.

4,051,277

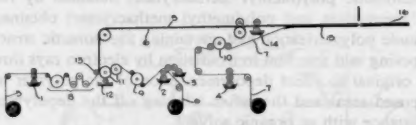
RIGID-WHEN-WET PAPERBOARD CONTAINERS AND THEIR MANUFACTURE

Robert M. Wilkinson, Florissant, Mo., and James R. Lyon, Godfrey, Ill., assignors to Alton Box Board Company, Alton, Ill.

Division of Ser. No. 277,646, Aug. 3, 1972, Pat. No. 3,886,019, which is a continuation-in-part of Ser. No. 39,086, May 20, 1970, abandoned. This application Apr. 14, 1975, Ser. No. 567,639

Int. Cl.[2] B31F *1/20;* C09J *5/02;* B32B *3/28, 29/00*

U.S. Cl. 427—288 5 Claims



1. In the art of manufacturing rigid-when-wet corrugated-board from a preformed web of medium and at least one performed web of liner, each of which has an obverse face and reverse face, the process comprising, surface-treating the reverse face of the liner web by printing thereon a controlled amount of a mixture composed with a curable thermosetting resinous material entrained in a vaporizable liquid vehicle without effecting the moisture absorbency of said obverse face, the thermosetting resinous material comprising about 35 to 65 percent by weight of the mixture when entrained in the vaporizable liquid vehicle, and immediately vaporizing at least a substantial part of the vehicle from the web by heating at a temperature and for a time less than that required to substantially advance the cure of the resinous material therein.

4,051,278

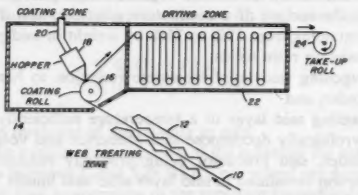
METHOD FOR REDUCING MOTTLE IN COATING A SUPPORT WITH A LIQUID COATING COMPOSITION

Roger E. Democh, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 6, 1975, Ser. No. 584,322

Int. Cl.[2] B05D *3/00, 3/04*

U.S. Cl. 427—326 16 Claims



1. In a method of coating a support with a coating composition comprising a film-forming material in an evaporable liquid vehicle in which said support is coated with a layer of said coating composition and said coated layer is dried, coating of said layer taking place within a coating zone containing a gaseous atmosphere and evaporation of said liquid vehicle occuring within said coating zone to thereby cause the temperature of the surface of said coated layer to decrease, the improvement which comprises maintaining at least two of (1) the temperature of the atmosphere within said coating zone, (2) the temperature of said support at the point where said coating composition is applied thereto, and (3) the temperature of said coating composition at the point where it is applied to said support, at a temperature which is substantially equivalent to the equilibrium surface temperature of said coated layer within said coating zone, said equilibrium temperature being the temperature assumed by the surface of said coated layer under steady state conditions of heat transfer following evaporative

cooling of said layer in said zone, whereby the formation of mottle in said coated layer is reduced.

4,051,279

PROTECTIVE COATINGS

Donald J. Peterson, Springfield Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 455,466, March 27, 1974, Pat. No. 3,889,025, which is a division of Ser. No. 208,024, Dec. 3, 1971, Pat. No. 3,839,052, which is a continuation-in-part of Ser. No. 158,527, June 30, 1971, abandoned. This application Mar. 11, 1975, Ser. No. 557,447

Int. Cl.[2] B05D *3/12*

U.S. Cl. 427—355 2 Claims

1. A process for removing marine organisms from surface comprising:

a. coating the organisms with an effective amount of an organotin composition comprising from about 0.1 to about 40% by weight of (organothiomethyl) triorganotin, (organosulfonylmethyl) triorganotin or (N,N-disubstituted aminomethyl)triorganotin compounds; and from about 60 to about 99.9% by weight of a carrier to render the organisms nonviable; and

2. scraping the surface to remove the non-viable organisms.

4,051,280

PROCESS FOR COATING TO FORM A FOAM FIND PROTECTIVE PACKAGE

Frank W. Mellows, Columbia, Md., assignor to Westvaco Corporation, New York, N.Y.

Filed June 9, 1975, Ser. No. 584,949

Int. Cl.[2] B05D *3/02*

U.S. Cl. 427—373 1 Claim

1. A method of producing a packaging material particularly for use in making heat sealable protective envelopes, said packaging material consisting of an outer paper substrate, an aqueous based heat sensitizable coating applied to one surface of said substrate and a foamed polymeric material of cellular structure adhered to substantially the entire area of the coated surface of said substrate comprising:

a. forming an aqueous coating of powdered polyethylene and a copolymer of ethylene and acrylic acid, said coating comprising from about 30 to 100 parts of a copolymer consisting of from about 70–85% ethylene and from about 30–15% acrylic acid and up to about 70 parts of a powdered polyethylene material having a particle size in the range of from about 10–30 microns, said coating having a solids content of from about 25 to 45%;

b. applying a continuous film of said coating uniformly to one surface of a paper substrate to produce a coat weight of at least about 3 pounds per ream;

c. drying said coating;

d. adhering a polyethylene foam material to substantially the entire area of the coated surface of said substrate under the influence of heat and pressure while leaving portions of said coating surface exposed to be heat sealed to themselves; and,

e. heat sealing said exposed surfaces to one another to form a foam lined protective envelope.

4,051,281

COMPOSITE OF RUBBER BONDED TO CLASS FIBERS

Gerard E. van Gils, Tallmadge, and Edward F. Kalafus, Akron, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 380,939, July 19, 1973, Pat. No. 3,930,095. This application Sept. 29, 1975, Ser. No. 617,459

Int. Cl.[2] B05D *3/02, 7/24;* B29H *9/10, 13/00*

U.S. Cl. 427—379 11 Claims

1. A method for adhering a glass fiber reinforcing element to a rubber compound which comprises treating said element with a composition comprising essentially an aqueous alkaline dispersion of 100 parts by weight of a rubbery vinyl pyridine copolymer, from about 2 to 28 parts by weight of trimethylol phenol, from about 1.25 to 24 parts by weight of at least one water soluble, thermoplastic and non heat hardenable resorcinol compound selected from the group consisting of resorcinol and a resorcinol-formaldehyde novolak, from about 0 to 3 parts by weight of an alkaline material selected from the group consisting of NH_4OH and NaOH, and from about 170 to 1100 parts by weight of water, heating said treated element at a temperature and for a time sufficient to remove essentially all of the water from said composition and to provide said element with a heat cured adhesive in an amount of from about 10 to 40% by weight (dry) based on the weight of said reinforcing element, combining said dried and heat cured adhesive containing reinforcing element with an unvulcanized rubber compound, and vulcanizing the same, said composition coating and at least substantially totally impregnating said element.

4,051,282

PRODUCTION OF TREATED WOOD HAVING EASY PENETRABILITY

Dan L. Davies, Gibsonia, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed June 14, 1976, Ser. No. 695,577

Int. Cl.[2] B05D *1/18, 3/02*

U.S. Cl. 427—393 10 Claims

1. In a pressure treating process for wood wherein wood is impregnated with a treating solution containing one or more impregnants selected from the group of preservatives and fire retardants and a liquid carrier selected from the group consisting of aliphatic hydrocarbons and halogenated aliphatic hydrocarbons that are liquids at elevated pressures and that have boiling points below 130° C. at atmospheric pressure and wherein the impregnated wood is treated to evaporate the liquid carrier, the improvement which comprises:

adding to the treating solution an effective lubricating amount of an oil having a kinematic viscosity of not less than 2.5 centistokes at 100° F. and not more than 5.8 centistokes at 100° F. and having a distillation range such that not more than about 50 percent of the volume distills below or about 450° F. and not more than about 90 percent of the volume distills below or about 550° F.

4,051,283

PRINTED SHEETS CONTAINING CONCEALED IMAGES AND METHOD AND MATERIALS FOR PREPARATION AND VISUAL DEVELOPMENT OF SAME

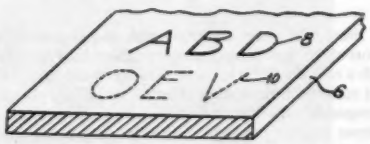
Richard E. Thomas; Robert T. Florence; Rustom H. Dalal, all of Chicago, Ill., and Raymond I. Scheuer, Sunnyvale, Calif., assignors to A. B. Dick Company, Niles, Ill.

Division of Ser. No. 757,067, Sept. 3, 1968, Pat. No. 3,632,364. This application June 28, 1971, Ser. No. 157,482

The portion of the term of this patent subsequent to Jan. 4, 1989, has been disclaimed.

Int. Cl.[2] B41M *5/16, 5/18, 5/22, 3/17*

U.S. Cl. 428—29 4 Claims



1. A transfer sheet for spirit duplication to produce concealed images containing an oxidizing agent capable of oxidizing a subsequently applied iodide to produce a color forming iodine reactant, in which the transfer sheet comprises a flexible paper base sheet having a transfer coating containing a colorless, soluble copper salt and an amine selected from the group

consisting of piperidine, piperazine, phenylenediamine, tallowamine, trichloromelamine, triisopropenolamine, and melamine to improve the hygroscopic character of the copper salt.

4,051,284

METHOD FOR PRODUCING HEAT RESISTANT SYNTHETIC RESIN TUBES

Noriyoshi Ohkubo, and Nobu Kitamura, both of Hiratsuka, Japan, assignors to The Furukawa Electric Company Limited, Tokyo, Japan

Filed May 15, 1974, Ser. No. 470,139

Claims priority, application Japan, May 16, 1973, 48-54370; Jan. 25, 1974, 49-10437[U]

Int. Cl.[2] B29C *1/12*

U.S. Cl. 428—36 **28 Claims**

1. Resin tubes for thin wire electrical insulator comprising non-extrudable heat resistant resin varnish, said varnish being such that when it is applied and cured on American Wire Gauge No. 18, copper wire, thereby increasing the overall diameter of the wire by 0.003 inch, the resin layer formed will have a thermal life of at least 20,000 hours at 120° C and a cut-through temperature of at least 250° C, said tubes being seamless and having an inner diameter not greater than 5mm and a thickness not greater than 0.3mm.

2. A method for molding seamless heat resistant synthetic resin tubes from non-extrudable resin, said tubes having an inner diameter of not more than 5 mm. and a thickness of not more than 0.3 mm., comprising applying a heat resistant synthetic resin varnish on American Wire Gauge No. 18, copper wire, thereby increasing the overall diameter of the wire by 0.003 inches, the resin layer formed having a thermal life of at least 20,000 hours at 120° C, and a cut-through temperature of at least 250° C after curing, curing said resin varnish to form a synthetic resin layer on the metal wire, drawing the heat resistant synthetic resin coating and wire above the yield point of the metal wire and separating the resulting synthetic resin tube from the metal wire.

4,051,285

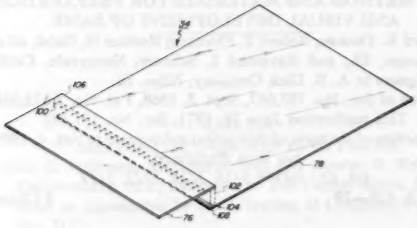
TEARABLE EDGE STRIP FOR PLASTIC SHEET

William E. Kramer, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 6, 1973, Ser. No. 367,608

Int. Cl.[2] B65D *65/28;* G09F *3/00*

U.S. Cl. 428—43 **4 Claims**



1. A sheet of support material employed in a sheet feeding apparatus of the type having a rotary driven feed roll cooperating with a retard roll for seriatim feeding of sucessive sheets of support material from a stack thereof, including:

a transparent non-fibrous flexible polymeric portion; and

a fibrous flexible paper portion extending in an outwardly direction from said non-fibrous portion having the trailing marginal region thereof overlapping and secured adhesively to the leading marginal region of said non-fibrous portion with said fibrous being interposed between the feed roll and retard roll during the forward advancement of the sheet of support material to facilitate separation of successive sheets of support material from the stack thereof, said fibrous portion being serrated in the region thereof adjacent to said non-fibrous portion to permit the portions to be readily separated from one another.

4,051,286

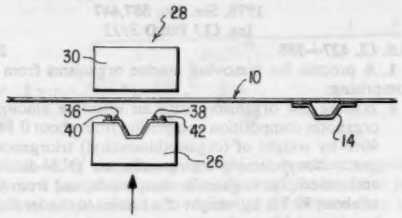
DUAL ADHESIVE METHOD AND ARTICLE

Richard Abbott, Dearborn Heights, Mich., assignor to Fruehauf Corporation, Detroit, Mich.

Division of Ser. No. 534,802, Dec. 20, 1974, Pat. No. 3,971,688. This application Feb. 27, 1976, Ser. No. 662,007

Int. Cl.[2] B32B *15/04, 15/08*

U.S. Cl. 428—77 **2 Claims**



1. A reinforced sheet particularly for roofs and walls of trucks and trailers, comprising in combination:

a metal sheet and a plurality of bow elements, said sheet and bow elements having juxtaposed bonding surfaces; and

side-by-side layers of adhesive extending substantially throughout the areas of said bonding surfaces and joining the sheet to said bow elements, one of said layers of adhesive being a hot melt adhesive which provides an initial bond of moderate strength and the other layer of adhesive being a catalyzed room temperature curing adhesive which develops a high bonding strength after said hot melt adhesive is set.

4,051,287

RAISED WOVEN OR KNITTED FABRIC AND PROCESS FOR PRODUCING THE SAME

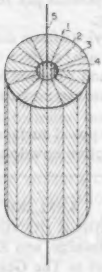
Kazushige Hayashi; Norihiro Minemura, both of Ibaraki; Iwao Fujimoto, Waki; Kiyotaka Ozaki, Iwakuni; Norio Yoshida, Ibaraki; Toshio Morishita, Iwakuni, and Takanori Shinoki, Matsuyama, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Dec. 8, 1975, Ser. No. 638,595

Claims priority, application Japan, Dec. 12, 1974, 49-142040

Int. Cl.[2] B32B *7/00*

U.S. Cl. 428—91 **40 Claims**



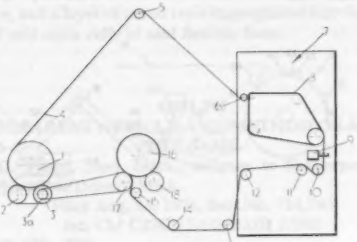
1. A raised woven or knitted fabric having at least one raised surface, which comprises at least one yarn consisting of synthetic hollow composite fibers each composed of at least four alternating segments of fiber-forming polyester and fiber-forming polyamide in which composite fibers said polyester and polyamide segments are adhered and encompass the hollow

core and extend along the longitudinal axes of said fibers to form a tube-shaped body, said polyester and polyamide segments of said composite fibers located in at least said raised surface portion of said fabric being separated from each other to form numerous very fine fibrils.

4,051,288
METHOD OF PRODUCING REINFORCED SHEET MATERIAL

Alister Wilson, Kilmory, Rosebank Lane; William David Marr, 13 Pitreuchie Place, both of Forfar, Angus, and George Arthur Guild, 2 Golf Road, Kirriemuir, Angus, DD8 4PY, all of Scotland

Filed May 20, 1976, Ser. No. 688,305
Claims priority, application United Kingdom, May 21, 1975, 21762/75
Int. Cl.² B32B *31/12*
U.S. Cl. 428—102 **8 Claims**

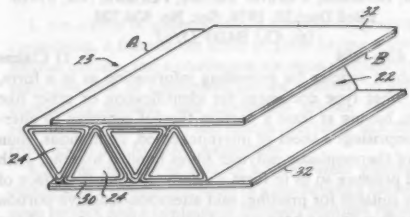


1. In a method of producing a reinforced sheet of a foam material comprising a layer of a foam material reinforced with a stitched system of substantially non-extensible yarn disposed generally parallel to the surface of the foam material which method includes feeding a layer of foam material through a stitching machine and thereby incorporating the reinforced stitching in the foam material, the improvement comprising feeding the foam material to the stitching machine at a rate greater than that at which the stitched system of reinforcing is produced by the machine.

4,051,289
COMPOSITE AIRFOIL CONSTRUCTION

Arthur P. Adamson, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Apr. 12, 1976, Ser. No. 675,902
Int. Cl.² B32B *5/12*
U.S. Cl. 428—113 **22 Claims**



1. A composite article having an upper surface and a lower surface and comprising a plurality of columnar elements bonded together along adjacent complementary interfaces, each of said element characterized by:

a bundled core of high modulus, substantially parallel core filaments embedded in a core matrix; and

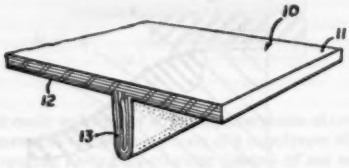
a sheet of high modulus, substantially parallel sheet filaments embedded in a sheet matrix, wherein

the longitudinal axes of the sheet filaments are oriented at an angle to the core filaments and said sheet is wrapped and bonded about said core such that at least a portion of the sheet filaments run transverse to the core filaments through the article in a direction from the upper surface to the lower surface, at the interface.

4,051,290
SINK-FREE PANELS

Ralph B. Jutte, Granville, and Roger L. Lehman, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 430,844, Jan. 4, 1974, abandoned. This application Nov. 10, 1975, Ser. No. 630,488
Int. Cl.² B32B *3/00*; B29D *3/02*
U.S. Cl. 428—168 **4 Claims**



1. An as molded glass fiber reinforced plastic panel having an integrally formed rib and an exposed smooth surface free of visual surface distortion, comprising,

chopped glass strands having an average length of not more than one inch extending into said rib to reinforce the rib,

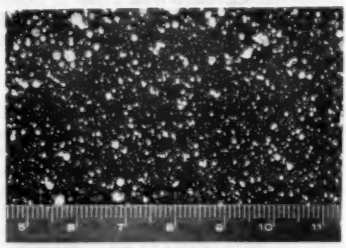
continuous glass strands having an average length of at least two inches interposed between said chopped strands and said exposed surface, the continuous strands bridging the rib, and

the juncture of said rib with said panel being defined by sharp, essentially fillet-free corners in that any lead-in radius is less than the order of magnitude of approximately 0.01 inch.

4,051,291
GYPSUM WALLBOARD

William J. Long, Chicago, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Continuation of Ser. No. 221,324, Jan. 27, 1972, abandoned. This application July 23, 1974, Ser. No. 491,097
Int. Cl.² B32B *7/14, 3/00*
U.S. Cl. 428—201 **6 Claims**



1. In a panel comprising a rehydrated gypsum core securely bonded to a paper cover sheet by a starch adhesive disposed at the interface of said core and said cover sheet, the improvement wherein said starch adhesive is nonmigratory and is disposed at limited areas of said interface, the amount of starch present at said limited areas being sufficient to provide secure

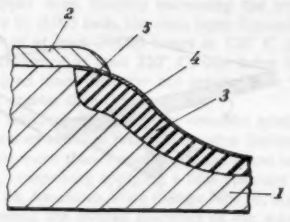
bonding of said paper cover sheet to said gypsum core when said starch adhesive has set, and wherein substantial areas of said interface are free of said starch adhesive, said free areas being sufficient to provide wet bonding of said cover sheet to said core prior to the setting of said starch adhesive, the portion of said paper cover sheet spaced from said interface being substantially free of starch.

4,051,292

PNEUMATIC TIRE BLANKS AND PROCESS

Erich Kresta, Perchtoldsdorf, and Werner Gorter, Baden, both of Austria, assignors to Semperit Aktiengesellschaft, Vienna, Austria

Filed Mar. 2, 1973, Ser. No. 337,610
Claims priority, application Austria, Feb. 29, 1972, 1648/72
Int. Cl.² B32B *7/02*; B60C *15/00*
U.S. Cl. 428—212 **5 Claims**



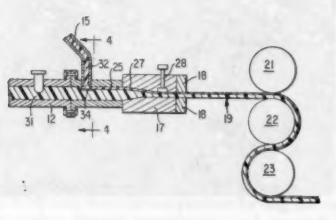
1. A pneumatic tire blank for vulcanization in a bellowless vulcanizing device having a clamping system, said tire blank comprising a bead region which circumferentially engages said clamping system when positioned therein, the bead region of the tire blank being formed of a first vulcanizable material positioned only at the bead region of the tire blank, a second vulcanizable material forming the remaining portions of the tire blank, said first vulcanizable material being vulcanizable more rapidly than the second vulcanizable material, whereby vulcanization of the entire tire blank in said clamping system is effected in a manner which precludes the adverse effects of temperature gradients produced in the tire blank by the engagement of the clamping system against the bead region.

4,051,293

CO-EXTRUSION OF POLYVINYLIDENE FLUORIDE/POLYSTYRENE MULTIPLE-LAYERED SHEETING

Donald F. Wiley, Big Spring, Tex., assignor to Cosden Oil & Chemical Company, Big Spring, Tex.

Division of Ser. No. 128,939, March 29, 1971, Pat. No. 3,968,196. This application Mar. 2, 1976, Ser. No. 663,192
Int. Cl.² B32B *7/02, 27/00*
U.S. Cl. 428—213 **5 Claims**



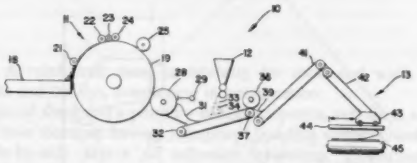
1. A composite sheeting material having a thickness of from about 10 mils to about three-eighths inch comprising a major layer constituting at least 80% of the thickness of said sheeting of a styrene polymer selected from the group consisting of homopolystyrene, impact polystyrene and normal styrene copolymers containing a minor portion of a copolymerizable monomer, and a minor surface layer constituting less than about 20% of the thickness of said sheeting of a vinylidene fluoride polymer, said surface layer being firmly united to said layer of styrene polymer solely by the adhesive forces of said styrene polymer and said vinylidene fluoride polymer, said vinylidene fluoride polymer being characterized by having an intrinsic or adjusted melt viscosity under extrusion conditions which is within the range of about 50 to 150% of the melt viscosity of said styrene polymer under said conditions.

4,051,294

FIBEROUS BATT AND METHOD FOR PRODUCING SUCH

George Sumner Buck, Jr.; Robert George Weyker, both of Memphis, and Arthur Gerard Ward, Arlington, all of Tenn., assignors to Fiberlok, Inc., Memphis, Tenn.

Filed Sept. 12, 1975, Ser. No. 612,783
Int. Cl.² B32B *31/00*
U.S. Cl. 428—283 **8 Claims**



1. A process for producing a fibrous batt comprising the steps of:

I. forming a thin web of 5 to 95 weight percent cotton fibers, balance polyester fibers,

II. contacting the web with an adhesive amount of particles of a copolymer of vinyl chloride and vinylidene chloride;

III. forming the web into a batt by laying the web transversely back and forth on a moving belt such that the batt comprises a plurality of webs; and

IV. heating the batt to a temperature above the sticking point of the copolymer but below the melting point of the polyester

wherein the weight ratio of vinyl chloride to vinylidene chloride is 1:99 to 40:60, and

wherein the weight ratio of the copolymer to the fibers is 1:99 to 30:70 and

wherein the copolymer particles have a size range of from 1 to 200 microns.

4,051,295

ALTERATION-SENSITIVE SURFACE

Donald J. Bernstein, 2 Grover Terrace, Fairlawn, N.J. 07410

Filed Dec. 20, 1974, Ser. No. 534,726
Int. Cl.² B42D *15/02*
U.S. Cl. 428—288 **11 Claims**

1. A sheet articles for providing information as in a form, card or other type document for identification or other like purposes, having at least a portion thereof sensitive to alteration comprising: a sheet of interconnected, continuous, spun strands of thermoplastic polymer fibres bonded together with heat and pressure so as to form a relatively smooth surface of a texture suitable for printing; said alteration-sensitive portion of said surface having been treated with a solvent so as to have caused swelling of the surface fibres during the treatment and to result in a surface which is rendered permanently more easily degraded by abrasion; the solvent being sufficient to provide at least about 2% selling of the fibres at 86° F after a five minute immersion of the sheet material in pure solvent; and information applied onto the treated portion of the surface; so that an attempt to erase said information will simultaneously

cause a visible abrasion of at least some part of said treated portion of said surface, thereby revealing that an alteration has been made.

4,051,296

SILICONE RUBBER MOLD

Leo J. Windecker, Midland, Tex., assignor to International Harvester Company, Chicago, Ill.

Filed Mar. 14, 1977, Ser. No. 777,378
Int. Cl.² B32B 3/26
U.S. Cl. 428—311 8 Claims

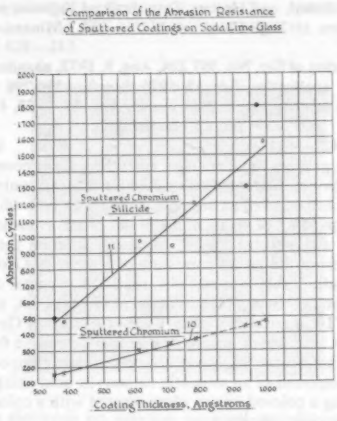
1. A reinforced silicone rubber mold comprising a silicone rubber mold member having a mold surface conforming to the desired pattern and a rigid laminated member, said laminated member including a flexible open-celled foam having one surface bonded to the back surface of said silicone rubber mold member by a layer of silicone rubber impregnated into the layer of open cells of said foam that are adjacent to said one surface, and a layer of cured resin impregnated into the remainder of said open cells of said flexible foam.

4,051,297

TRANSPARENT ARTICLE AND METHOD OF MAKING THE SAME

Neil D. Veigel, Novi, Mich., assignor to Shatterproof Glass Corporation, Detroit, Mich.

Filed Aug. 16, 1976, Ser. No. 714,783
Int. Cl.² C23C 15/00; B32B 17/06
U.S. Cl. 428—336 5 Claims


Comparison of the Abrasion Resistance of Sputtered Coatings on Soda Lime Glass
Abrasion Cycles
Sputtered Chromium Silicide
Sputtered Chromium
Coating Thickness, Angstroms

1. An article of manufacture, a transparent glazing element comprising, a transparent sheet of glass having a smooth continuous surface, and a continuous abrasion resistant transparent reflective film of chromium silicide adhered to said smooth continuous surface, said chromium silicide film consisting essentially of chromium and silicon and being of a thickness of from about 200 to 1,000 Angstroms.

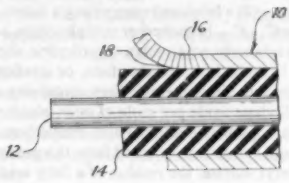
5. In the method of making a transparent glazing element comprising a transparent sheet of glass having a smooth continuous surface and a continuous abrasion resistant reflective film adhered to said smooth continuous surface, the improvement which comprises providing a sputtering target of chromium silicide consisting essentially of chromium and silicon, and sputtering said chromium silicide from said target in a low-pressure atmosphere containing an inert gas onto said smooth continuous surface of the glass sheet to form a transparent film having a thickness of from about 200 to 1,000 Angstroms.

4,051,298

STRIPPABLE COMPOSITE OF POLYMERIC MATERIALS FOR USE IN INSULATED ELECTRICAL CONDUCTORS, A METHOD OF FORMING THE SAME AND PRODUCTS THEREOF

Thaddeus Dominick Misiura, Sandy Hook; Joseph Edward Vostovich, Bridgeport, and Ralph Edward Wahl, Trumbull, all of Conn., assignors to General Electric Company, Bridgeport, Conn.

Division of Ser. No. 468,397, May 9, 1974, Pat. No. 3,925,597. This application Aug. 28, 1975, Ser. No. 608,447
Int. Cl.² B32B 27/00
U.S. Cl. 428—383 7 Claims



1. An easily and cleanly strippable composite of cured polymeric materials comprising a body of a copolymer of ethylene and propylene having an ethylene content of not more than about 50% by weight with a surface adheringly joined to a contacting surface of a body comprising an elastomeric blend of about 20 to about 40 parts by weight of a copolymer of ethylene and propylene admixed with about 60 to about 80 parts by weight of chlorosulfonated polyethylene, said contacting surfaces of the bodies of polymeric materials being adheringly joined at their contacting surfaces by applying the body of the elastomeric blend while in an uncured condition to the body of the copolymer of ethylene and propylene in a cured condition and thereafter curing said body of the elastomer blend while a surface thereof is in adjoining physical contact with a surface of the cured body of the copolymer of ethylene and propylene.

5. A method of preparing an easily and cleanly strippable composite or cured polymeric materials comprising a body of a copolymer of ethylene and propylene having an ethylene content of not more than about 50% by weight with a surface adhereingly joined to a contacting surface of a body comprising an elastomeric blend of about 20 to about 40 parts by weight of a copolymer of ethylene and propylene admixed with about 60 to about 80 parts by weight of chlorosulfonated polyethylene, comprising curing a body of said copolymer of ethylene and propylene, applying to a surface of said cured body of copolymer of ethylene and propylene a body comprising said elastomeric blend in an uncured condition, and while the surfaces of said bodies of cured and uncured polymeric materials are in adjoining physical contact, curing said body of uncured elastomeric blend.

4,051,299

SYNTHETIC FIBERS OF ENHANCED PROCESSABILITY

William G. Steinmiller, Charlotte, N.C., assignor to Fiber Industries Inc., Charlotte, N.C.

Division of Ser. No. 451,631, March 15, 1974, Pat. No. 3,997,450, which is a continuation-in-part of Ser. No. 242,776, April 10, 1972, abandoned. This application Aug. 9, 1976, Ser. No. 712,635
Int. Cl.² B32G 27/00
U.S. Cl. 428—394 7 Claims

1. A synthetic copolymer or copolymer fiber having a finish thereon of from about 0.3 to about 1 percent by weight of a synthetic fiber finish composition consisting essentially of:

(1) an emulsifier comprising an alkylene (lower) oxide condensate of a synthetic ester of a branched or straight chain, saturated or unsaturated, aliphatic C_3 - C_{18} alcohol and a

branched or straight chain, saturated or unsaturated, aliphatic C_8 - C_{18} mono- or di-carboxylic acid; an alkylene oxide condensate of a polyhydric aliphatic C_6 - C_{18}, branched or straight chain, saturated or unsaturated, alcohol, or partial ester thereof with said aliphatic C_8 - C_{18} mono- or di-carboxylic acid, branched or straight chain, saturated or unsaturated; an alkylene oxide condensate of a long chain, branched or straight chain, saturated or unsaturated, aliphatic C_6 - C_{18} monohydric alcohol; an alkylene oxide condensate of an amide derived from an alkanol (lower) amine and a long chain saturated or unsaturated, branched or straight chain, aliphatic C_8 - C_{18} mono- or di-carboxylic acid; or an alkylene oxide condensate of an alkyl(C_6 - C_{18})-substituted, hydroxy-terminated aryl; or a mixture of these; (2) a lubricant comprising a mono- or di-ester of an aliphatic C_8 - C_{18}, branched or straight chain, saturated or unsaturated, carboxylic acid with a monohydric aliphatic alcohol C_3 - C_{18}, branched or straight chain, or a refined mineral, animal or vegetable oil; said emulsifiers containing up to about 50 moles of alkylene oxide per mole of ester, alcohol, or amide and the reactive hydroxyl sites of said emulsifiers containing deactivating end cap groups selected from the group consisting of methyl, acetyl, sulfate, the residue of a fatty acid (C_8 - C_{18}), phosphate, and mixtures thereof and (3) as an emulsifier-stabilizer component, a small but effective amount of an alkali salt of a dialkyl sulfosuccinate acid.

4,051,300

HOLLOW SYNTHETIC FIBERS

Elias Klein, New Orleans; James K. Smith, Slidell, and Frederick C. Morton, New Orleans, all of La., assignors to Gulf South Research Institute, Baton Rouge, La.

Continuation-in-part of Ser. No. 394,335, Sept. 3, 1973, abandoned. This application Feb. 27, 1976, Ser. No. 662,010

Int. Cl.[2] B05D *3/00*; D02G *3/22*

U.S. Cl. 428—398 **14 Claims**

1. In the method of forming a microporous high strength hollow fiber suitable for reverse osmosis, ultrafiltration and gas separations, said fiber having a continuous axial channel, said micropores having a size range less than 0.25 microns and said fibers capable of withstanding over 600 psi of applied pressure, the steps comprising:

a. forming a solution of a fiber-forming polymer, and adding to said solution a second polymer consisting of polyvinylpyrrolidone having an average molecular weight of at least 2000 to form a stable two polymer solution from which the two polymers separate on coagulation, where the sum of the weight percent of the fiber-forming polymer and the weight percent of the second polymer of polyvinylpyrrolidone is at least 15 and not over 65, and the ratio of the fiber-forming polymer to the weight percent of the second polymer of polyvinylpyrrolidone is at least 0.5 and not over 55;

b. extruding the resulting polymer solution through an orifice equipped for coaxial extrusion;

c. contacting the extrudate with a precipitating liquid that is miscible with the solvent for the fiber-forming polymer, is a non-solvent for the fiberforming polymer, and is a solvent for the second polymer of polyvinylpyrrolidone, and

d. washing the resulting hollow fiber substantially free of residual solvents and non-fiber-forming material.

4,051,301

FURAN-PHENOLIC RESIN COATED SAND FOR COLLAPSIBLE FOUNDRY MOLDS

Robert Laitar, Chicago, Ill., assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Oct. 16, 1975, Ser. No. 623,132

Int. Cl.[2] B22C *1/16*

U.S. Cl. 428—404 **12 Claims**

1. A resin coated sand comprising:

1. particles of sand coated with from about 1% to about 8% by weight of the sand of a furan-modified novolak resin prepared by

a. reacting of furfuryl alcohol with a phenol at an acid pH; with the mole ratio of furfuryl alcohol to the phenol being within the range of 0.04 to 0.9, to produce a furfuryl-phenolic intermediate, and

b. reacting of said intermediate with a C_1 to C_3 aliphatic aldehyde at an acid pH, with the molar ratio of aldehyde to the total of the phenol and furfuryl alcohol being within the range of 0.5 to 0.85

c. and separating the resin; and

2. a curing agent.

4,051,302

METHOD OF IMPROVING ADHESIVE PROPERTY OF PLASTIC SUPPORTS

Masayoshi Mayama, and Kiyoyuki Miura, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1976, Ser. No. 663,076

Claims priority, application Japan, Mar. 4, 1975, 50-26384

Int. Cl.[2] B05D *3/06*

U.S. Cl. 428—411 **2 Claims**

1. A method of improving adhesive property of plastic supports which comprises coating the plastic support on the surface with an aqueous liquid containing a hydrophilic polymer and hydrogen peroxide and irradiating the coated surface with ultraviolet rays while keeping said coated surface in its wet state where the hydrogen peroxide is present.

4,051,303

RECORDING SHEET

Takao Hayashi, and Hajime Kato, both of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 387,228, Aug. 9, 1973, abandoned. This application July 17, 1975, Ser. No. 596,798

Claims priority, application Japan, Aug. 15, 1972, 47-81681

Int. Cl.[2] B41M *5/22*

U.S. Cl. 428—411 **14 Claims**

1. The process for forming a recording sheet comprising a support having thereon a color developer layer containing (1) a metal compound of an aromatic carboxylic acid which is the reaction product of an alkali metal salt of an aromatic carboxylic acid and a water soluble metal salt wherein the metal is selected from the group consisting of a metal of Group 1B of the Periodic Table, a metal of Group IIA, a metal of Group IIB, a metal of Group IIIB, a metal of Group IVA, a metal of Group VIA, a metal of Group VIIB or a metal of Group VIII and (2) at least one of gelatin or a gelatin derivative formed by reacting gelatin with an aromatic or aliphatic compound, said metal compound of an aromatic carboxylic acid being capable of forming a colored image when reacted with a color former, which process comprises:

reacting said alkali metal salt of said aromatic carboxylic acid and said water-soluble metal salt in the presence of at least one of said gelatin or said gelatin derivative and thereafter coating the resulting product on said support to provide said recording sheet.

4,051,304

ELECTRIC BATTERIES

James Chetwood Snook, Hale, England, assignor to Chloride Group Limited, London, England

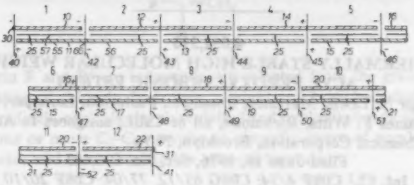
Filed Feb. 20, 1976, Ser. No. 659,894

Claims priority, application United Kingdom, Feb. 21, 1975, 7489/75

Int. Cl.[2] H01M *4/00*

U.S. Cl. 429—94 **17 Claims**

1. A multi-cell lead acid electric storage battery in which each cell electrode structure comprises an assembly of a single first electrode incorporating a lead support of one polarity

separated by a separator from a single second electrode incorporating a lead support of the other polarity an integral portion of said first electrode support extending out to one side of its cell and an integral portion of said second electrode support extending out to the other side of its cell, said first integral portion being connected to or integral with an electrode support structure in the adjacent cell, or a battery terminal, on its

side of each cell, and the other integral portion being connected to an integral with an electrode support structure in the adjacent cell on its side of each cell, said integral portions extending substantially the full width or substantially the full height of the side of each cell, the cells being arranged to provide an array of multiple layers of electrodes of alternating polarity.

4,051,305

ELECTRODES FOR GALVANIC ELEMENTS

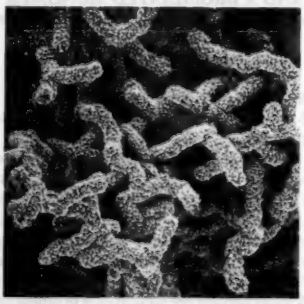
Gabor Benczür-Urmössy, Stuttgart, and Ute Baumeyer, Rommelshausen, both of Germany, assignors to Deutsche Automobilgesellschaft m.b.H., Germany

Filed May 31, 1974, Ser. No. 475,175

Claims priority, application Germany, June 1, 1973, 2327931

Int. Cl.[2] H01M *4/52*; B22F *9/00*

U.S. Cl. 429—217 **27 Claims**



1. In a electrode for galvanic elements including one of an active mass and an electrocatalyst, an organic binding agent, and a conductive substance. the improvement wherein said conductive substance is a comminuted form of a moss-like material of fiber-shaped crystal aggregates obtained by thermal decomposition of a gaseous carbonyl selected from the group consisting of nickel carbonyl, iron carbonyl and mixtures thereof in the presence of a non-preheated inert gas in a decomposition zone heated to about 300° to 500° C., the gaseous carbonyl being mixed with said inert gas at a ratio of 1:1 to about 1:100.

22. A method for producing a conductive substance for use in electrodes for galvanic elements, comprising the steps of evaporating a material selected from the group consisting of nickel carbonyl, iron carbonyl and mixtures thereof to produce a carbonyl gas, mixing the carbonyl gas obtained thereby with an inert gas having undergone no preheating when mixed with said carbonyl gas, and causing the gas mixture to undergo thermal decomposition by conducting the gas mixture at atmospheric pressure to a decomposition zone heated to the decomposition temperature of said carbonyl gas whereby the growth of crystals one upon the other into a voluminous product comprising a moss-like material of fiber-shaped crystal aggregates is attained and thereafter comminuting the voluminous product obtained from the decomposition zone into particle size smaller than 1 mm.

4,051,306

CONTROLLED ENVIRONMENTAL DETERIORATION OF PLASTICS

John W. Tobias, East Lansing; Lynn J. Taylor, Haslett, and Stuart J. Gaumer, Midland, all of Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 238,466, March 27, 1972, abandoned. This application Feb. 12, 1976, Ser. No. 657,657

Int. Cl.[2] C08J *3/20*

U.S. Cl. 526—1 **16 Claims**

1. A process for preparing a degradable plastic composition, which process comprises:

a. preparing a partially oxidized organic polymer by heating an oxidizable organic polymer in the presence of gaseous oxygen;

b. and then incorporating said partially oxidized organic polymer into a thermoplastic organic base polymer different from said oxidizable polymer.

4,051,307

POLYMERIZATION PROCESS

Anthony David Caunt, Welwyn Garden City, and Michael Stanley Fortuin, St. Albans, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed June 4, 1973, Ser. No. 367,006

Claims priority, application United Kingdom, June 9, 1972, 27008/72; June 9, 1972, 27009/72; July 7, 1972, 31884/72; Feb. 9, 1973, 7985/73; Feb. 19, 1973, 7986/73

Int. Cl.[2] C08F *4/66, 10/06*

U.S. Cl. 526—77 **20 Claims**

1. An olefine polymerisation catalyst comprising

1. a solid halide or oxyhalide compound of a transition metal of Group IVA to VIA of the Periodic Table, wherein the said metal has a valency below its maximum;

2. an organo-metallic compound of aluminium, or of a non-transition metal of Group II of the Periodic System, or a complex of an organo-metallic compound of a non-transition metal of Group I or II of the Periodic System, and an organo-aluminium compound; and

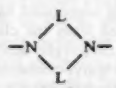
3. at least one phosphorus compound selected from materials of the formula

$$R''_2P(Q)_eXP(Q)_eR''_2$$

wherein

R'' is halogen, a hydrocarbyl group, a group —NR'''$_2$ or —OR''', a heterocyclic group, a group (E—Z—G), or both groups R'' attached to the same P atom together form a group

R''' is a hydrocarbyl group; X is —O—, NR''''—, —E(CH$_2$)$_m$E— or



R'''' is a hydrogen atom or a hydrocarbyl group;
each L is a bivalent hydrocarbyl radical and may be the same or different;
each E is —O—, —S— or —NR''''— and may be the same or different;
G is —OR'''', —SR'''', —NR''''$_2$, —PR''''$_2$ or a heterocyclic ring system whereof the heteroatom is O, S, N or P;
Q is an oxygen or sulphur atom;
Z is a bivalent hydrocarbyl radical such that E and G, or E and E are separated by not more than 3 carbon atoms;
each *a* is independently zero or one; and
m is a positive integer.

4,051,308

PROCESS FOR POLYMERIZING BUTADIENE WITH COBALT COMPLEX, ALR_3 AND CS_2

Adel Farhan Halasa, Bath, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 491,721, July 25, 1974, abandoned. This application Nov. 6, 1975, Ser. No. 629,437
The portion of the term of this patent subsequent to Nov. 23, 1993, has been disclaimed.
Int. Cl.^{2} C08F *1/52, 3/18*
U.S. Cl. 526—141 **14 Claims**

1. A process for the preparation of polybutadiene high in syndiotactic 1,2 structure range of 190°–227° C., which comprises polymerizing 1,3-butadiene in the liquid phase in the presence of a catalyst composition consisting essentially of:

a. a complex of a cobalt salt selected from the class consisting of halides, carboxylates, carbonate and thiocarboxylates, said complex being formed with a cyclic compound having an amino nitrogen and a keto or thioketo group therein selected from the class consisting of N-methylpyrrolidone, pyrrolidone, caprolactam, p-aminoacetophenone, N,N-dimethyl-p-aminoacetophenone, N-methyl-2-aminocyclohexanone, N-methyl-thiopyrrolidone and thiocaprolactam;
b. a reducing agent having the formula AlR_3, wherein R is a hydrocarbon radical of 1-8 carbon atoms; and
c. CS_2.

4,051,309

PROCESS FOR COPOLYMERIZING CONJUGATED DIENE AND ALPHA-OLEFIN

Jung Wong Kang, Clinton, and James Oziomek, Akron, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 627,983, Nov. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 509,525, Sept. 26, 1974, abandoned. This application Feb. 17, 1977, Ser. No. 769,745
Int. Cl.^{2} C08F *236/02*
U.S. Cl. 526—141 **13 Claims**

1. A process for the hydrocarbon solution polymerization of a monomer composition containing 10–90 percent by weight of a conjugated diene and 10–90 percent by weight of an alpha-olefin having 2–10 carbon atoms to produce a copolymer having 5–90 percent of the alpha-olefin in the resultant copolymer comprising the steps of maintaining said monomer composition at a temperature in the range of −30° to 50° C in intimate contact with a catalyst composition consisting essentially of:

a. an aluminum hydride of the formula R_2AlH where R is hydrogen or a hydrocarbon radical of 1–20 carbon atoms, there being at least one hydrocarbon radical per molecule;
b. a metal halide compound having the formula $TiBr_nCl_{4-n}$ or VBr_mCl_{5-m} wherein *n* has a value of 0–4 and *m* has a value of 0–5; and
c. a carbonyl-containing compound having no more than 20 carbon atoms selected from the class consisting of aldehydes, ketones and carboxylic acids, esters, amides and carbamates; said carbonyl-containing compound having no halogen atoms therein except that there may be a chlorine attached directly to a carbon of an aromatic ring in said compound; the concentration of said titanium or vanadium halide being 0.1–4 millimoles per 100 grams of said monomer composition, said aluminum hydride being present in a proportion of 1–4 moles per mole of titanium or vanadium halide, and said carbonyl compound being present in a proportion of 0.7–4 moles per mole of titanium or vanadium halide, said polymerization being conducted for a period of at least one hour.

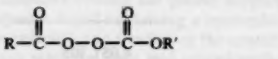
4,051,310

THERMALLY STABLE HIGH MOLECULAR WEIGHT ACYL PEROXYCARBONIC ESTERS

Roger N. Lewis, Martinez; Ronald L. Pastorino, Larkspur, and James F. Wilts, Richmond, all of Calif., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed June 16, 1976, Ser. No. 696,463
Int. Cl.^{2} C08F *4/34*; C08G *63/12, 77/04*; C08F *20/10*
U.S. Cl. 526—230 **16 Claims**

1. A process for the production of polymers which comprises subjecting a compound selected from ethylene, styrene, vinyl chloride, vinyl chloride-vinyl acetate comonomers, and methyl methacrylate in the presence of a polymerization initiating amount of an acyl peroxycarbonic ester of the formula:



where R is selected from methyl and ethyl; and R' is an alkyl group which together with R contains a total of 17 to about 25 carbon atoms.

4,051,311

INTERPOLYMERS OF A STYRENIC MONOMER, A MALEIC OR HALOMALEIC ANHYDRIDE MONOMER AND A BROMINATED MONOMER

Yoon C. Lee, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 29, 1975, Ser. No. 644,490
Int. Cl.^{2} C08F *212/08, 214/14, 214/16*
U.S. Cl. 526—271 **6 Claims**

1. A solid polymer consisting essentially of the interpolymerization product of:

A. from 55 to 90 percent by weight of a styrene monomer selected from the group consisting of styrene, alpha methyl styrene, chlorostyrene and bromostyrene;
B. from 5 to 25 percent by weight of a maleic anhydride monomer selected from the group consisting of maleic anhydride, monochloro maleic anhydride and bromo maleic anhydride;
C. from 5 to 20 percent by weight of a brominated monomer selected from the group consisting of bromophenyl acrylates, bromophenyl methacrylates, bromoneopentyl acrylates and bromoneopentyl methacrylates; and
D. from 0 to 30 percent by weight of a monomer selected from the group consisting of acrylonitrile, methacrylonitrile and methyl methacrylate;

and with the proviso that the amount of bromine in the polymer due to the brominated monomer of component (C) is at least 3 percent by weight.

4,051,312

SULFUR VULCANIZABLE INTERPOLYMERS

Irving Kuntz, Linden, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 452,969, March 20, 1974, abandoned. This application Nov. 6, 1975, Ser. No. 629,567
Int. Cl.^{2} C08F *210/00, 210/12, 212/02, 214/02*
U.S. Cl. 526—329 **3 Claims**

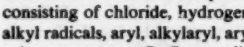
1. An alternating sulfur vulcanizable elastomeric interpolymer having a glass transition temperature of less than 0° C, an

inherent viscosity greater than 0.5 when measured in benzene at a temperature of 20° C and concentration of 0.1 g/dl, and a number average molecular weight in the range of about 10,000 to 700,000 comprising:

a. one or more C_2-C_{20} acyclic or alicyclic olefins having the general formula

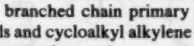
wherein R and R' are independently selected from the group consisting of chloride, hydrogen, straight and branched chain alkyl radicals, aryl, alkylaryl, arylalkyl and cycloalkyl radicals;

b. one or more C_1-C_{20} acyclic or alicyclic esters of acrylic acid, said esters having the general formula



wherein R is selected from the group consisting of straight or branched chain primary alkyl radicals, arylalkyl radicals and cycloalkyl alkylene radicals, and is free of olefinic unsaturation; and

c. a minor molar proportion, about 0.10 to 10 mol percent of the total monomers present in said interpolymer, of one or more C_4-C_{10} hydrocarbon acyclic conjugated diolefins, wherein the mol percent of the esters of acrylic acid and the sum of the mol percentages of the olefin and diolefin present in said interpolymer are each substantially equal to 50 mol percent, and wherein olefin monomer units of (A) above and acrylate monomer units of (B) above alternate to form polymer segments of variable length, interconnected by randomly distributed diolefin monomer units of (C) above and the microstructure of said interpolymer can be represented by



wherein *n* is an integer from 1 to 500.

4,051,313

PROCESS FOR PURIFYING POLYPROPYLENE

Luciano Luciani, and Gianni Nava, both of Ferrara, Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 494,221, Aug. 2, 1974, abandoned. This application Oct. 29, 1975, Ser. No. 626,704

Claims priority, application Italy, Aug. 3, 1973, 27504/73

Int. Cl.² C08F *6/08*

U.S. Cl. 528—496 **6 Claims**

1. A process for practically completely removing magnesium dihalide from a polypropylene obtained by polymerizing propylene in contact with a catalyst prepared by mixing (A) an aluminum trialkyl partially complexed with an electron-donor compound with (B) a titanium tri- or tetra-halide supported on an anhydrous magnesium dihalide, or a complex of a titanium tri- or tetra-halide with an electron donor compound supported on an anhydrous magnesium dihalide, and which polypropylene contains catalyst residues including magnesium dihalide, said process comprising mixing an aliphatic alcohol containing from 3 to 8 carbon atoms with a suspension of the polypropylene in a hydrocarbon solvent at a temperature of from 60° C to 100° C to thereby solubilize catalyst residues present in the polypropylene, including the magnesium halide, and thereafter separating both the solvent and the solubilized catalyst residues including the solubilized magnesium dihalide, from the polypropylene.

4,051,314

POLYSACCHARIDES AND METHOD FOR PRODUCING SAME

Shigeto Ohtsuka; Saburo Ueno; Chikao Yoshikumi; Fumio Hirose, all of Tokyo; Yoshio Ohmura, Tanashi; Toshihiko Wada, Mibu; Takayoshi Fujii, Tokyo, and Eiichi Takahashi, Urawa, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 80,755, Oct. 14, 1970, abandoned. This applicatioe Oct. 11, 1974, Ser. No. 513,958

Int. Cl.² C08B *37/00*

U.S. Cl. 536—1 **9 Claims**

6. The polysaccharide produced by the process comprising forming a culture medium or liquid extract of mycelium of a species of fungi belonging to the class Basidiomycetes and selected from the group consisting of *Coriolus versicolor, Coriolus conchifer, Coriolus paragamenus, Coriolus hirsutus, Coriolus biformis, Coriolus consors* and *Coriolus pubescens,* and separating the polysaccharide from said culture medium or liquid extract.

4,051,315

6''-DEOXYKANAMYCIN B AND 6''-DEOXYTOBRAMYCIN

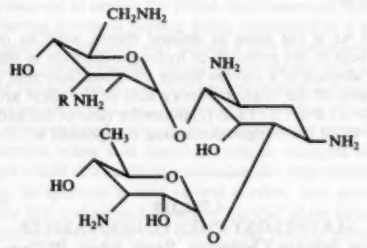
John Carl Godfrey, Syracuse, and Joseph Rubinfeld, Northport, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 523,292, Nov. 13, 1974, abandoned. This application Dec. 2, 1975, Ser. No. 636,886

Int. Cl.² C07H *15/22*

U.S. Cl. 536—10 **4 Claims**

1. A compound having the formula



in which R is hydrogen or OH; or a nontoxic pharmaceutically acceptable acid addition salt thereof,

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4,051,316

REMOVAL OF HEAVY METAL IONS FROM AQUEOUS SOLUTIONS WITH INSOLUBLE CROSSLINKED-STARCH-XANTHATES

Robert E. Wing, Peoria, and William M. Doane, Morton, both of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 515,262, Oct. 16, 1974, Pat. No. 3,979,286. This application June 14, 1976, Ser. No. 695,617

Int. Cl.² C08B *31/02*

U.S. Cl. 536—107 **6 Claims**

1. A composition useful for removing heavy metal ions from aqueous solutions comprising an alkali metal-magnesium salt of crosslinked-starch-xanthate having a degree of crosslinking (DCL) such that said salt exhibits a degree of swelling in water at 95° C. of from 65% to 450%, wherein said crosslinking occurs between the starch molecules of said salt through the hydroxyl oxygens of said molecules, and having said magnesium present in an amount ranging from about 0.5% to about 12.0% by weight of said salt.

4,051,317

XANTHAN RECOVERY PROCESS

Gordon Anson Towle, Landenberg, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Filed Aug. 2, 1976, Ser. No. 710,812
Int. Cl.² C08B 37/00
U.S. Cl. 536—114 4 Claims

1. A method of precipitating xanthan gum from an aqueous solution which comprises adding an aluminum salt to said solution, and thereafter increasing the pH of the solution to a level between about 3.5 and 4.5, said aluminum salt being selected from the class consisting of aluminum acetate, aluminum chloride, and aluminum nitrate.

4,051,318

PROCESS FOR PREPARING FORMATE ESTERS OF ALKYL-SUBSTITUTED AROMATIC HYDROXY COMPOUNDS

Takashi Suzuki, and Susumu Naito, both of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jan. 5, 1976, Ser. No. 646,594
Claims priority, application Japan, Jan. 16, 1975, 50-7210; Apr. 18, 1975, 50-47260
The portion of the term of this patent subsequent to Aug. 24, 1993, has been disclaimed.
Int. Cl.² C07C 69/06
U.S. Cl. 560—131 13 Claims

1. A process for preparing formate esters of the formula

HCOOAr

wherein Ar is an aromatic hydrocarbon group containing alkyl aromatic aldehyde of the general formula

ArCHO

wherein Ar is the same as defined above, with an organic peroxy acid in the presence of hydrogen fluoride in the presence or absence of a solvent under the conditions that (1) the molar ratio of the organic peroxy acid to the alkyl aromatic aldehyde is 1.0 to 1.5 : 1 and (2) the molar ratio of the hydrogen fluoride to all the oxygen-containing compounds is 0.5 to 4.0: 1.

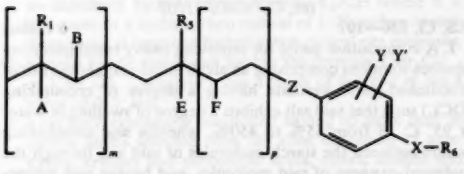
4,051,319

ALKYNYLOXY-PHENYL DERIVATIVES

Madhukar Subraya Chodnekar, Basel; Albert Pfiffner, Pfaffhausen; Norbert Rigassi, Arlesheim; Ulrich Schwieter, Reinach, and Milos Suchy, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 548,469, Feb. 10, 1975, Pat. No. 3,957,833, which is a division of Ser. No. 312,074, Dec. 4, 1972, Pat. No. 3,880,935, which is a division of Ser. No. 123,060, March 10, 1971, Pat. No. 3,718,686. This application Mar. 29, 1976, Ser. No. 671,453
Claims priority, application Switzerland, Mar. 25, 1970, 4621/70
Int. Cl.² C07D 303/38
U.S. Cl. 542—413 2 Claims

1. A compound of the formula



wherein R_1 and R_5 are methyl or ethyl; R_6 is lower alkynyl; A and B taken together form an oxygen bridge, and E and F taken together form a carbon to carbon bond; Z is oxygen; Y and Y' are hydrogen; X is —COO—; and *m* and *p* are 1.

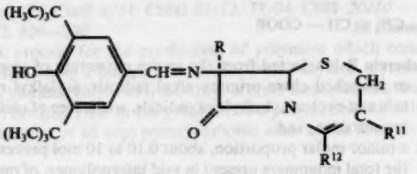
4,051,320

PROCESS FOR PREPARING ALKOXYLATED DERIVATIVES OF CEPHALOSPORIN COMPOUNDS

Hiroaki Yanagisawa; Akiko Ando; Masami Fukushima, and Hideo Nakao, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed July 3, 1975, Ser. No. 592,947
Claims priority, application Japan, July 24, 1974, 49-85007
Int. Cl.² C07D 501/02, 499/04
U.S. Cl. 542—420 7 Claims

1. A process for preparing a compound having the formula



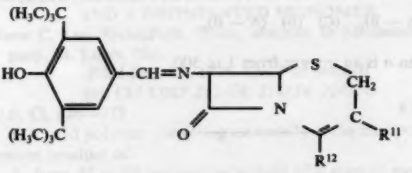
wherein

R^{11} is methyl, acetoxymethyl, (1-methyl-1H-tetrazol-5-yl) thiomethyl or 5-methyl-1,3,4-thiadiazol-2-yl-thiomethyl;

R^{12} is tert-butoxycarbonyl, benzhydryloxycarbonyl, p-bromophenacyloxycarbonyl, p-methoxybenzyloxycarbonyl or 2,2,2-trichloroethyloxycarbonyl; and

R is an alkoxy group having from 1 to 3 carbon atoms, which comprises contacting a compound having the formula

(IVa)

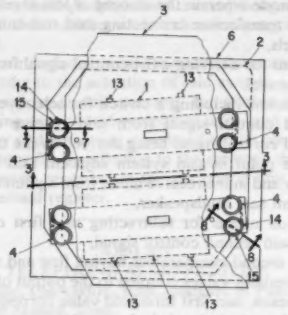


wherein R^{11} and R^{12} are as defined above, with from about 1.1to about 4 equivalents of a halide cation-producing compound per equivalent of said compound of formula (IV*a*), in the presence of a lower alkanol having from 1 to 4 carbon atoms and from about 1.2 equivalents to about 2 equivalents of a base per equivalent of said compound of formula (IV*a*), at a temperature of from about 0° C. to about −70° C., said halide cation-producing compound being selected from the group consisting of a halogen, N-chlorosuccinimide, N-bromosuccinimide, N-chloroacetamide, N-chlorphthalimide, N-bromophthalimide, N-chlorbenzenesulfonamide, N-bromobenzenesulfonamide, N-chloro-p-toluenesulfonamide, N-bromo-p-toluenesulfonamide, 1-bromobenzotriazole, 1-chlorotriazine, N,N-dibromohydantoin, tert-butylhypochlorite and tert-butylhypoiodite, and said base being selected from the group consisting of an alkali metal hydroxide, an alkaline earth metal hydroxide, lithium methoxide, sodium methoxide, potassium methoxide, lithium ethoxide, sodium ethoxide, potassium ethoxide, calcium ethoxide, potassium tert-butoxide, lithium cyclopropoxide, lithium propargyloxide, lithium benzyloxide, sodium benzyloxide, lithium hydride, sodium hydride, calcium hydride, butyl lithium, phenyl lithium, trimethylamine, triethylamine, tributylamine, N-methylpiperidine, N,N'-dimethylpiperidine, N-methylpyrrolidine, 1,8-diazabicyclo-[5,4,0]-7-undecene, pyridine and picoline.

4,051,321
DUAL SPRING CLIP FOR MOUNTING ELECTRICAL DEVICES

Donald D. Buell, 3040 Harris Road, Kelso, Wash. 98626

Filed Sept. 18, 1975, Ser. No. 614,422
Int. Cl.[2] H02G 3/08
U.S. Cl. 174—57 4 Claims



1. In an electrical outlet assembly the combination of the following:

a. an outlet box having an open end and mounting lips projecting partially across the open end of the box,

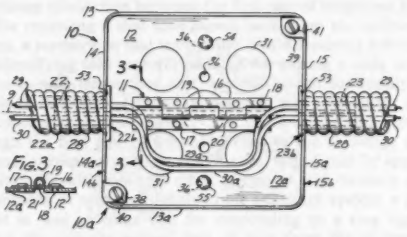
b. an electrical device having a mounting ear on each end thereof for attachment to an outlet box, and

c. a dual spring clip securing a mounting ear of the electrical device to a mounting lip of the box, said dual spring clip comprising two parallel springs, each of which is in clamping engagement with a mounting ear of the electrical device and a member joining the two springs and serving to clamp the dual spring clip to the box.

4,051,322
ELECTRICAL JUNCTION BOX

William Park, 7522 Valjean, Van Nuys, Calif. 91403, and Leo A. LeVitre, 20762 Schoolcraft, Canoga Park, Calif. 91306

Filed June 27, 1975, Ser. No. 590,950
Int. Cl.[2] H02G 3/08
U.S. Cl. 174—65 R 10 Claims

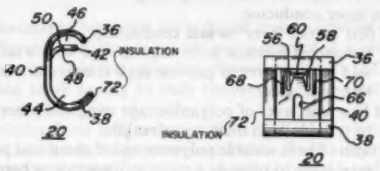


1. An electrical junction box comprising a base formed of two base parts with a peripheral wall structure, including opposite end walls each comprising a pair of end wall parts joined to the periphery of the base, and a pair of opposite tubular split connectors attached to and projecting from said opposite end walls for attaching to a cable sheath, said end walls being split in a plane through the connectors, one of said connector parts being attached to each of said end wall parts and hinge means connected and related to the end walls permitting the end wall parts to pivot relative to each other from a normal position in which the parts of the respective end walls and connectors are in abutment, to another position in which said parts separate from each other so that the tubular connectors become open laterally to receive a conductor, said end wall parts being shaped to provide an opening for said conductors.

4,051,323
CONNECTOR FOR COUPLING A GROUND CONDUCTOR TO THE SHIELD OF A SHIELDED CONDUCTOR

John J. Churla, Belle Mead, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Oct. 14, 1976, Ser. No. 732,331
Int. Cl.[2] H01R 5/10
U.S. Cl. 174—78 9 Claims

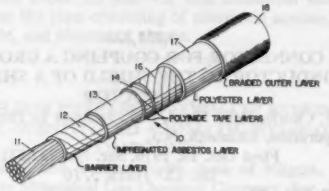


1. A connector for grounding the exposed shield of a jacketed shielded conductor from which a portion of the jacket has been removed to expose the shield, said connector being of the type having a central portion being preformed in a generally C-shaped configuration and having a first curved end portion of a first predetermined radius of curvature and a second curved end portion of a second predetermined radius of curvature larger than said first predetermined radius of curvature, said first curved end portion moving within said second curved end portion when said cental portion is wrapped about the exposed shield of a shielded conductor, the improvement comprising: an aperture in said central portion, said aperture defined by first and second generally parallel edges extending in the direction from said first curved end portion towards said second curved end portion and third and fourth edges each extending generally transverse to said first and second edges; a tab having an interior surface and an exterior surface and extending from said third edge and generally overlying said aperture; said tab having a first edge generally parallel with said first edge defining a portion of said aperture and a second edge generally parallel with said second edge defining a portion of said aperture; said tab having a first strengthening rib adjacent said tab's first edge and a second strengthening rib adjacent said tab's second edge, said tab's first and second strengthening ribs preventing the bending of said tab as said connector is brought into intimate contact with the exposed shield of a shielded conductor; said tab being curved and having a third predetermined radius of curvature greater than said first predetermined radius of curvature; said interior surface of said tab and said second curved end portion defining therebetween a shielded conductor receiving cavity, and the exterior surface of said tab and said first curved end portion defining therebetween a ground conductor receiving cavity; said first curved end portion moving within said second curved end portion as said connector is brought into intimate contact with the exposed shield of a shielded conductor when placed in said shielded conductor receiving cavity and said moving first curved end portion closing said ground conductor receiving cavity upon a ground conductor when placed therein.

4,051,324
RADIATION RESISTANT CABLE AND METHOD OF MAKING SAME

Robert W. Anderson, decreased, late of Burlington, Vt., by Dorothy M. Anderson, executrix; Robert E. Smith, Jr., Burlington, Vt., assignors to Haveg Industries, Inc., Wilmington, Del.

Filed May 12, 1975, Ser. No. 576,522
Int. Cl.[2] H01B 7/00
U.S. Cl. 174—121 R **5 Claims**

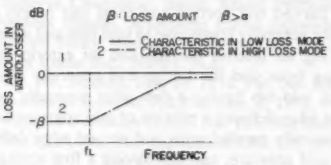


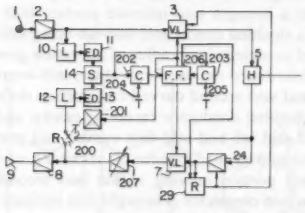
1. An electrical cable comprising:
an inner conductor;
a first barrier layer on said conductor;
a compacted asbestos layer impregnated with a saturant on said barrier layer to provide high temperature and radiation resistance;
at least one layer of polyimide tape over said asbestos layer to provide high dielectric strength;
a layer of heat-sealable polyester sealed about said polyimide tape layer to provide a moisture impervious barrier; and
a braided filamentary outer layer to provide protection against abrasion, said braided outer layer sealed to said heat-sealable polyester layer.

4,051,325
SPEECH INTERCOMMUNICATION SYSTEM

Yasuo Mafune, and Juhei Takahashi, both of Yokohama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 27, 1976, Ser. No. 652,847
Claims priority, application Japan, Jan. 31, 1975, 50-13888; July 8, 1975, 50-84244; Nov. 14, 1975, 50-137437
Int. Cl.[2] H04M 9/10
U.S. Cl. 179—1 HF **4 Claims**



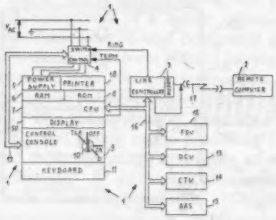


1. An intercommunication system comprising
a transmit channel and a receive channel, said transmit channel including a microphone operative in the transmit mode and a first variolosser circuit, and said receive channel including a loudspeaker operative in the receive mode, a manually gain-adjustable circuit, a second variolosser circuit and an automatic gain control amplifier, said first and second variolosser circuits each providing a variable amount of loss and permitting the high frequency region of the voice frequency band to pass therethrough including a mode wherein the amount of loss is relatively large,
a hybrid transformer connecting said transmit and receive channels,
first means for deriving a firt control signal from said transmit channel,
second means including a switch for selectively deriving a second control signal from said receive channel, said second control signal being derived in the transmit mode from a point in said system adjacent said hybrid transformer and in the receive mode from a point in said system adjacent said loudspeaker,
subtraction means for subtracting said first control signal from said second control signal,
first and second comparators having first and second different threshold values coupled to the output of said subtraction means, said first threshold value corresponding to the second control signal derived adjacent said loudspeaker and said second threshold value corresponding to the second control signal derived adjacent said hybrid transformer, and
a flip-flop having first and second inputs coupled to the outputs of said first and second comparators, respectively, and first and second outputs coupled to said first and second variolosser respectively, said flip-flop selecting the variable amount of loss in said first and second variolosser in accordance with the outputs of said comparators.

4,051,326
ARRANGEMENT FOR THE REMOTE SWITCHING-ON AND INITIALIZATION OF A DATA TERMINAL

Guido Badagnani, Fiorano, and Giancarlo Carioli, Banchette, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Aug. 17, 1976, Ser. No. 715,127
Claims priority, application Italy, Sept. 30, 1975, 69411/75
Int. Cl.[2] H04M 11/00
U.S. Cl. 179—2 DP **3 Claims**



1. A terminal apparatus including an arrangement for switching on and initializing the terminal when connected to a telephone line connecting said terminal to a remote computer, comprising
a read/write memory for storing instructions and data,
a power supply unit connectable to a voltage source for supplying power voltage to the terminal apparatus,
a manually operable switch actuatable for controlling the switching on of the terminal apparatus by the remote computer,
a switch control unit,
means responsive to the actuation of said switch for connecting said voltage source to said switch control unit,
means included in said switch control unit for recognizing a

call signal transmitted by the remote computer on the telephone line,

a logical circuit included in said switch conrol unit and activated by said recognizing means in presence of the call signal for connecting the power supply unit to the voltage source and for generating a signal activating the initialization operations of the data terminal,

a plurality of peripheral units connected to said terminal, at least one of said peripheral units comprising an information record for storing an initialization program for said terminal,

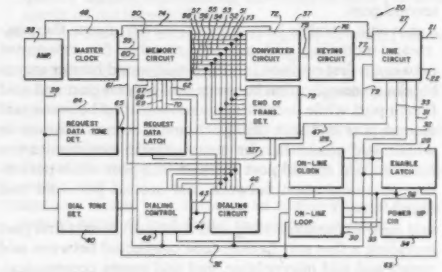
a first register included in said memory for storing information relating to the actuation of said switch,

a second register in said memory for storing information designating one of said peripheral units, and means controlled by said activating signal and by the contents of the first register for transferring to the memory the initialization program recorded in the peripheral unit designated by the second register.

4,051,327
TELEPHONE ALARM SYSTEM

Jesse H. Rigsby, Clarksville, Tenn., assignor to Pan-X Corporation, Indian Mound, Tenn.

Filed Apr. 30, 1976, Ser. No. 681,834
Int. Cl.[2] H04M *11/04*
U.S. Cl. 179—5 R **22 Claims**

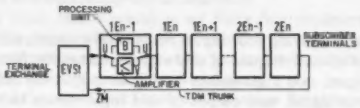


1. In a telephone alarm system, transmitter and receiver units for connection to first and second pairs of telephone lines interconnectable through a telephone exchange system, said transmitter unit including a line circuit for establishing a low impedance connection between the first pair of telephone lines and for receiving a dial tone signal back from the exchange system, a memory in said transmitter unit for storing information identifying said receiver unit and for storing a code word unique to said transmitter unit, a clock circuit for supplying signals to said memory, dialing means in said transmitter unit controllable from said memory for transmitting dial signals through the first pair of telephone lines to the exchange system, means responsive to receipt of a dial tone signal for applying clock signals from said clock circuit to said memory and transmission of said dial signals to the exchange system, a line circuit in said receiver unit for responding to a ring signal applied through the second pair of lines from the exchange system and for establishing a connection to the second pair of lines and to thereby complete a connection between said transmitter and receiver units through the telephone lines and the exchange system for signal transmission therebetween, means in said receiver unit for transmitting a request data tone signal following the establishment of said completed connection, request data tone detector means in said transmitter unit for detecting a request data tone signal transmitted back from said receiver unit through said completed connection, code signal transmission means in said transmitter unit controllable from said memory for transmitting keyed signals to said receiver unit through said completed connection, means responsive to detection of a request data tone signal by said detector means for applying clock signals from said clock circuit to said memory and transmission of said keyed signals to said receiver unit through said completed connection, signal receiving means in said receiver unit arranged for responding to said transmitted keyed signals to develop output signals, and means for applying said output signals to display means to display said code word unique to said transmitter unit.

4,051,328
METHOD FOR OPERATING A DIGITAL TIME DIVISION MULTIPLEX COMMUNICATION NETWORK

Alfred Mattern, Grobenzell, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 5, 1975, Ser. No. 601,987
Claims priority, application Germany, Aug. 8, 1974, 2438199
Int. Cl.[2] H04J *3/00*
U.S. Cl. 179—15 AL **12 Claims**



1. A method of operation for a digital communication network wherein subscriber terminals are connected in a predetermined order to at least one time division multiplex (TDM) trunk, said trunk having its ends connected to a central exchange, comprising the steps of:

transmitting from said exchange on said TDM trunk communication data for predetermined ones of said subscriber terminals participating in a given call in the order of the connection of said predetermined subscriber terminals to said TDM trunk, all other subscriber terminals being blocked from receiving, but passing, said communication data,

readying said participating subscriber terminals for receiving said communication data, while blocking subscriber terminals other than said participating subscriber terminals from receiving communication data,

receiving in each said participating subscriber terminal, processing and transmitting further said communication data transmitted from said exchange, while blocking the others of said participating subscriber terminals from receiving a communication data transmitted from the aforementioned participating subscriber terminal and

disabling said participating subscriber terminals from receiving further communication data transmitted from said exchange after performing said receiving, processing and transmitting step.

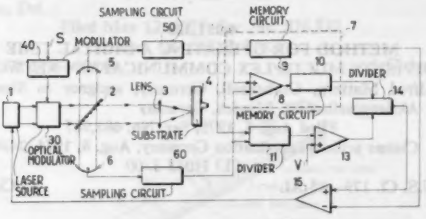
4,051,329
OPTICAL INFORMATION RECORDING SYSTEM IN WHICH THE ENERGY WHEN TRANSMITTED TO THE RECORDING LAYER IS CONSTANT

Bruno Blondet; Sylvain Kretschmer; Jean Pierre Lacotte, and Jean Paul Peltier, all of Paris, France, assignors to Thomson-Brandt, Paris, France

Filed Mar. 16, 1976, Ser. No. 667,442
Claims priority, application France, Mar. 21, 1975, 75.08945
Int. Cl.[2] G11B *7/72*; H04N *5/76, 5/84*
U.S. Cl. 179—100.3 N **5 Claims**

1. An optical system for recording information on a photosensitive layer deposited on a substrate, comprising a coherent light source for emitting a radiation beam, said source having a control input, optical means for dividing said beam into a reference beam and a second beam, an optical device for focusing said second beam onto said photosensitive layer, a first part of said second beam being transmitted to said photosensitive layer and a second part being reflected by said photosensitive layer, first means for detecting said reference beam having a first output for delivering a first signal proportional to the energy E(t) of said second beam, second means having a sec-

ond output for delivering a second signal proportional to the energy R(t) E(t) reflected by said photosensitive layer, storage means for storing signals characteristic of the energies E(t) and R(T) E(t) at an instant taken as reference, said energies being Eo and RoEo, said storage means having two outputs, and



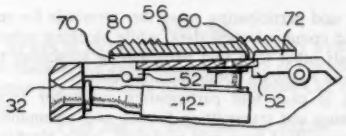
logic means having four inputs respectively connected to said first and second outputs of said storage means for forming an error signal, said logic means having an output for delivering said error signal, said output of said logic means being connected to said control input of said source, the energy when transmitted to said photosensitive layer being kept constant.

4,051,330

HEARING AID HAVING ADJUSTABLE DIRECTIVITY

William A. Cole, Brantford, Canada, assignor to Unitron Industries Ltd., Kitchener, Canada

Filed May 17, 1976, Ser. No. 687,434
Claims priority, application Canada, June 23, 1975, 229948
Int. Cl.[2] H04R *1/38, 25/00*
U.S. Cl. 179—107 FD **3 Claims**



1. In a hearing aid comprising:
1. a casing,
2. a microphone having first and second spaced sound ports, the improvement comprising:
3. means defining a third port in said casing,
4. means communicating said third port to said first port,
5. means defining fourth and fifth ports, said fourth port being located adjacent said third ports and said fifth port being spaced substantially from said third port,
6. means communicating said fourth and fifth ports to said second port,
7. a movable member having sound barrier means thereon,
8. means mounting said movable member for movement between a first position in which said sound barrier means blocks communication between said second port and said fourth port while permitting communication between said second port and said fifth port, and a second position in which said sound barrier means blocks communication between said second port and said fifth port while permitting communication between said second port and said fourth port,
9. said movable member being a slider plate having a longitudinal channel in the lower surface thereof, said means **(8)** including means mounting said slider plate for sliding movement on said casing, said channel having front and rear openings, said front opening being said fourth port and said rear opening being said fifth port, a divider wall located in said channel and constituting said sound barrier means, said means **(8)** including sound conduit means communicating said channel to said second port,
10. said means mounting said second tube on said casing comprising a thin rectangular support plate having an opening therein, means securing said second tube to said support plate with the opening in said support plate member aligned with the interior opening of said second tube, said casing having an upper substantially rectangular opening therein, said rectangular opening being of substantially the same length as said support plate and being of width slightly greater than that of said support plate, said casing having a pair of lips therein to support said support plate with the upper surface of said support plate flush with the upper surface of said casing, said slider plate having a pair of L-shaped legs extending through said opening in said casing and under said casing for said slider plate to slide in said opening in said casing with said channel aligned with the opening in said support plate.

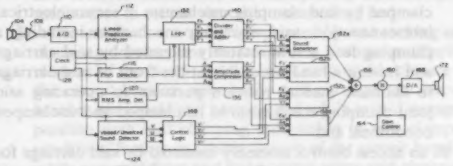
2. In a hearing aid comprising:
1. a casing,
2. a microphone having first and second spaced sound ports, the improvement comprising:
3. means defining a third port in said casing
4. means communicating said third port to said first port,
5. means defining fourth and fifth ports, said fourth port being located adjacent said third port and said fifth port being spaced substantially from said third port,
6. means communicating said fourth and fifth ports to said second port,
7. a movable member having sound barrier means thereon,
8. means mounting said movable member for movement between a first position in which said sound barrier means blocks communication between said second port and said fourth port while permitting communication between said second port and said fifth port, and a second position in which said sound barrier means blocks communication between said second port and said fifth port while permitting communication between said second port and said fourth port,
9. said means communicating said third port to said first port including a first soft flexible tube connected between said casing and said microphone, and said means communicating said fourth and fifth ports to said second port including a second soft flexible tube connected to said microphone, and means supporting said second soft flexible tube on said casing, said microphone being supported by said tubes and said tubes thereby providing vibrational isolation between said microphone and said casing,
10. said movable member being a slider plate having a cover surface and a longitudinal channel in said lower surface, and means **(8)** including means mounting said slider plate for sliding movement on said casing with said lower surface contacting said casing, said channel having front and rear openings, said front opening being said fourth port and said rear opening being said fifth port, a divider wall located in said channel and constituting said sound barrier means, said second tube communicating with said channel,
11. said means mounting said second tube on said casing comprising a thin rectangular support plate having an opening therein, means securing said second tube to said support plate with the opening in said support plate member aligned with the interior opening of said second tube, said casing having an upper substantially rectangular opening therein, said rectangular opening being of substantially the same length as said support plate and being of width slightly greater than that of said support plate, said casing having a pair of lips therein to support said support plate with the upper surface of said support plate flush with the upper surface of said casing, said slider plate having a pair of L-shaped legs extending through said opening in said casing and under said casing for said slider plate to slide in said opening in said casing with said channel aligned with the opening in said support plate.

4,051,331

SPEECH CODING HEARING AID SYSTEM UTILIZING FORMANT FREQUENCY TRANSFORMATION

William James Strong, and Edward Paul Palmer, both of Provo, Utah, assignors to Brigham Young University, Provo, Utah

Filed Mar. 29, 1976, Ser. No. 671,420
Int. Cl.[2] G10L 1/00
U.S. Cl. 179—107 R 17 Claims



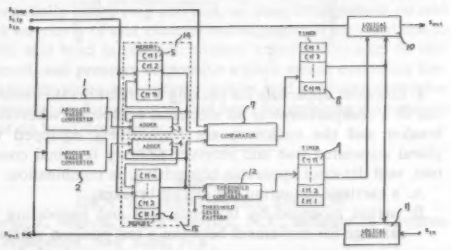
1. A hearing aid system comprising
means for receiving a vocal speech signal,
an analog to digital converter coupled to said receiving means,
an analyzer means coupled to said converter for producing signals representative of the spectral envelope of said speech signal at predetermined intervals therein,
logic means for processing the signals produced by said analyzer means and for producing, at said intervals, frequency signals representing the frequencies F_n of n formants of the speech signal,
means for reducing said frequency signals by some predetermined value to obtain frequency signals F'_n,
a plurality of sound generators adapted to produce digital information representing oscillatory signals having frequencies F'_n,
means for combining said digital information representing said oscillatory signals to produce an output signal,
a digital to analog converter coupled to said combining means, and
transducer means for producing an auditory signal from the output signal of said digital to analog converter.

4,051,332

MULTIPLEX DIGITAL ECHO SUPPRESSION SYSTEM

Kazuo Izumi, and Kazuto Izumi, both of Yokohama, Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 495,885, Aug. 8, 1974, abandoned. This application Feb. 25, 1976, Ser. No. 661,381
Claims priority, application Japan, Aug. 20, 1973, 48-92371
Int. Cl.[2] H04B 3/20
U.S. Cl. 179—170.2 5 Claims



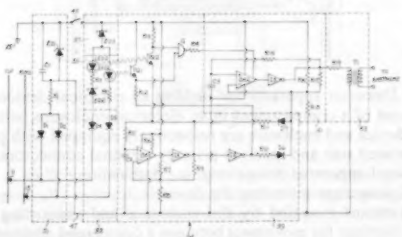
1. A multiplex digital echo suppression system comprising
a. a transmitter-side absolute value converter for converting the transmitting-side PCM signal for each channel into a parallel PCM signal with the sign bit eliminated and representing the absolute value of the transmitting-side PCM signal,
b. a receiving-side absolute value converter for converting the receiving-side PCM signal for each channel into a parallel PCM signal with the sign bit eliminated and representing the absolute value of the receiving-side PCM signal,
c. a transmitting-side accumulator and a receiving-side accumulator each for accumulating the output signal from the corresponding absolute value converter for a predetermined time,
d. first comparator means for comparing the output signal of each channel derived from said transmitting-side accumulator in synchronism with the transmitting-side PCM signal with the output signal for the corresponding channel derived from said receiving-side accumulator in synchronism with the receiving-side PCM signal and for generating the output signal when the output from said transmitting-side accumulator is higher than the output from said receiving-side accumulator,
e. first timer means which is set for a first predetermined time in response to the output signal from said first comparator means and continuously generates an output signal during said first predetermined time,
f. second threshold lever comparator means for comparing a predetermined threshold leverl with the output for each channel derived from said receiving-side accumulator and for generating an output signal when the output from said receiving-side accumulator is higher than said predetermined threshold level,
g. second timer means which is set for a second predetermined time shorter than said first predetermined time in response to the output signal from said second comparator means and continuously generates an output signal during said second predetermined time,
h. receiving-side logic circuit means including attenuator means for attenuating the receiving-side input PCM signal in said certain channel in response to the output for said certain channel from said first timer means, and
i. transmitting-side logic circuit means including echo switching means for opening and closing said echo switching means for said certain channel in response to a logical combination of the outputs for said certain channel from said first and second timer means.

4,051,333

TIP AND RING CONDUCTOR VOLTAGE TESTER

Richard A. Schomburg, Hillsboro, Oreg., assignor to Communication Sciences Corporation, Hillsboro, Oreg.

Filed Apr. 14, 1976, Ser. No. 676,700
Int. Cl.[2] H04B 3/46
U.S. Cl. 179—175.3 R 22 Claims



1. A circuit-energized voltage tester for simultaneously testing a pair of related conductors of a telecommunication system to determine whether or not the voltages on said conductors are within their normal ranges, said circuit-energized voltage tester comprising:
probe means for making a separate electrical connection to each conductor of a pair of related conductors;
ground means for making a ground connection;
energy storage means, connected to said probe means and to

said ground means, for storing electrical energy derived from the power present on said conductors;

sensing means, connected to said probe means, for sensing the voltage applied to said probe means by each conductor of said pair of conductors and providing first and second information signals related thereto, the nature of said first information signal being related to whether or not the voltage on one of said conductors is within its normal range and the nature of said second information signal being related to whether or not the voltage on the other of said conductors is within its normal range;

interrogation means, connected to said energy storage means so as to be energized thereby, said interrogation means including: (i) detecting means for detecting said first and second information signals; and, (ii) enabling means for selectively producing enabling signals when the nature of either or both of said first and second information signals indicates that the voltage on their related conductor is outside of its normal range; and

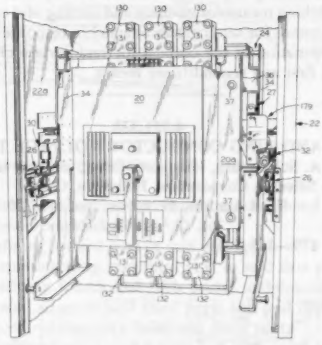
indicating means, connected: (i) to said energy storage means so as to be energized thereby; and (ii) to said interrogation means so as to receive said enabling signals, for producing an indication when an enabling signal is produced by said interrogation means, the nature of said indication denoting whether the voltage on one or both of said conductors are outside of their normal ranges.

4,051,334

SWITCHBOARD DRAWOUT APPARATUS WITH INTERLOCKED JOINT CLAMPING AND RACKING MECHANISMS

Eric Axel Ericson, Plainville, Conn., assignor to General Electric Company, New York, N.Y.

Filed June 21, 1976, Ser. No. 698,294
Int. Cl.[2] H02B 1/04
U.S. Cl. 200—50 AA **11 Claims**



1. Drawout apparatus for racking an electrical device into and out of a compartment in an electrical enclosure, wherein the device and enclosure are respectively equipped with plural associated stab and receiver primary terminal connectors, said drawout apparatus comprising, in combination:

A. a carriage mounting the device;

B. means mounted by the enclosure and supporting said carriage for movement between a disengaged position and an engaged position through an intermediate test position;

C. a racking mechanism mechanically assisting movement of said carriage and device between said test and engaged positions, said racking mechanism including a racking lead screw rotatably mounted by said carriage and having a head accessible at the front of said carriage to facilitate manual rotation pursuant to operating said racking mechanism to effect movement of said carriage and device between said test and engaged positions;

D. a joint clamping mechanism mounted by said carriage, said clamping mechanism having joint clamped and unclamped conditions, with said clamping mechanism in said unclamped position, contact elements of associated stab and receiver connectors readily move into and out of lapped relation as said carriage and device are moved into and out of said engaged position, with said clamping mechanism in its clamped condition and the device and carriage in its engaged position, the lapped contact elements of associated stab and receiver connectors are clamped by said clamping mechanism in secure electrical interconnection, said clamping mechanism including a clamping lead screw rotatably mounted by said carriage and having a head accessible at the front of said carriage to facilitate manual rotation pursuant to operating said joint clamping mechanism to its clamped and unclamped conditions; and

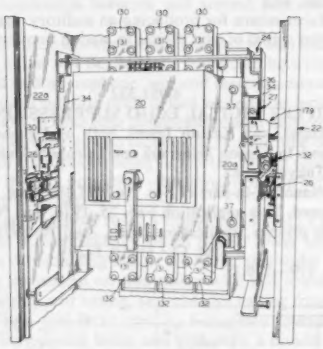
E. an access control assembly mounted by said carriage for movement between a first position affording access to said racking lead screw head while denying access to said clamping lead screw head and a second position affording access to said clamping lead screw head and denying access to said racking lead screw head, said assembly mechanically interlocked with the position of said carriage and the condition of said clamping mechanism such as to regulate movement of said access control assembly between said first and second positions.

4,051,335

SWITCHBOARD DRAWOUT HAVING TRIP INTERLOCK AND POSITION INDICATING APPARATUS

Eric Axel Ericson, Plainville, and Frederick Daniel Kaufhold, Forestville, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed June 21, 1976, Ser. No. 698,277
Int. Cl.[2] H02B 1/04
U.S. Cl. 200—50 AA **11 Claims**



1. Drawout apparauts for racking a circuit breaker into and out of a compartment in an electrical enclosure, wherein the breaker and the enclosure are respectively equipped with plural associated stab and receiver primary terminal connectors, said drawout apparatus comprising, in combination:

A. a carriage mounting the circuit breaker;

B. means mounted by the enclosure and supporting said carriage for movement between a test position where the stab and receiver connectors are in separated relation and an engaged position where contact elements of the associated primary stab and receiver connectors are in lapped relation;

C. a racking mechanism mechanically assisting manually induced movement to said carriage and breaker between said test and engaged positions;

D. a joint clamping mechanism mounted by said carriage, said clamping mechanism manually operable between

joint unclamped and joint clamped conditions, with said racking mechanism in said unclamped condition, the contact elements of associated stab and receiver connectors readily move into and out of lapped relation as said carriage and breaker move into and out of said engaged position, with said clamping mechanism in its clamped condition and the breaker and carriage in said engaged position, the lapped contact elements of associated stab and receiver connectors are clamped by said clamping mechanism in secure electrical connection; and

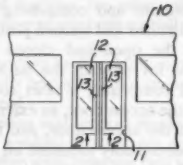
E. a trip interlock controllably operated by said racking and clamping mechanisms to selectively actuate a tripping element of the circuit breaker such as to enable closure of the circuit breaker only while said carriage and circuit breaker are in said test position and while in said engaged position with said clamping mechanism in said clamped condition, further to inhibit closure of the circuit breaker while removed from said test position when said clamping mechanism is in its unclamped condition, and still further to trip the circuit breaker incident to initial movement of said carriage out of said test position and upon initial operation of said clamping mechanism from its clamped to unclamped conditions.

4,051,336

PRESSURE SENSITIVE DOOR EDGE SWITCH AND ACTUATOR CONSTRUCTION

Norman K. Miller, Concordville, Pa., assignor to Miller Brothers, Concordville, Pa.

Filed Apr. 29, 1976, Ser. No. 681,430
Int. Cl.² H01H 3/16; E05F 15/02
U.S. Cl. 200—61.43 **10 Claims**



1. A pressure sensitive door edge construction comprising a rigid channel for extension along a door facing outwardly therefrom, inturned lips on said channel spaced apart to define therebetween a longitudinal slot communicating between the interior and exterior of said channel, a resiliently depressible bead extending exteriorly along said channel in overlying engagement with said lips and bridging said slot, a reduced neck on the inner side of said bead extending through and substantially occupying said slot, an inner enlargement on said neck interiorly of said channel and engageable with said lips to retain said bead in position without other securement to said channel, and pressure responsive switch means extending longitudinally along and entirely within said bead and operative responsive to depression of said bead for stopping door movement on bead depression.

4,051,337

DENTAL HANDPIECE SWITCH

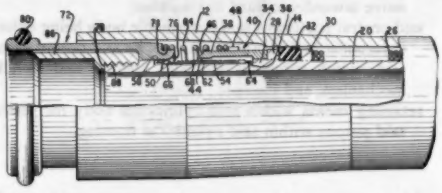
George E. Warrin, North Merrick, N.Y., assignor to Cavitron Corporation, New York, N.Y.

Filed Jan. 27, 1976, Ser. No. 652,682
Int. Cl.² H01H 9/06
U.S. Cl. 200—61.85 **2 Claims**

1. A dental handpiece switching apparatus for controlling an ultrasonic dental prophylaxis handpiece in which a substantial portion of the volume of the handpiece contains a magnetostrictive stack and a stack energizing coil comprising:

a thin membrane contact assembly that is retained in a generally circumferential arrangement in the outer portion of the handpiece to minimize the size of the handpiece and including (1) a first metallic foil contact mounted on a coextensive insulating backing, (2) a second metallic foil contact mounted on a coextensive insulating backing, said first and second contacts being arranged in circumferential facing relationship and (3) a thin, non-conducting separator between said contacts and having an opening therein to permit electrical communication between said first and second contacts;

actuation means for controlling the electrical communication between said first and second contacts including (1)



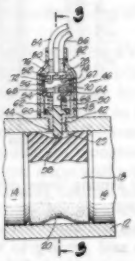
an actuation finger attached to the handpiece and cantilevered over said contact assembly and having a free end with (a) a flat tip generally facing said assembly in proximity to the opening in said separator and (b) an end surface adjacent said tip that is inclined with respect to said assembly, (2) a slideable moveable actuator that surrounds said handpiece and is moveable to strike said inclined surface to force said tip into contact with said assembly so that electrical communication is realized between said first and second contacts and (3) biasing means in contact with said handpiece and said actuator for normally biasing said actuator away from contact with said finger.

4,051,338

LOAD RESPONSIVE SWITCH ACTUATOR

Newton T. Harris, III, Canoga Park, Calif., assignor to Greer Hydraulics, Inc., Los Angeles, Calif.

Filed May 23, 1975, Ser. No. 580,310
Int. Cl.² H01H 3/14
U.S. Cl. 200—85 R **4 Claims**



1. A switch and switch actuator assembly comprising:

a generally cylindrical housing member having a peripheral wall; means defining an opening in said peripheral wall of said housing;

said peripheral wall of said cylindrical housing having an interior peripheral surface defining a chamber;

a generally cylindrical body of deformable material disposed within said housing chamber; said cylindrical body of deformable material being co-axially aligned with said cylindrical housing; said cylindrical body having a central portion;

said interior peripheral surface of said peripheral wall of said cylindrical housing and the outer peripheral surface of said central portion of said deformable cylindrical body

defining a generally annular space therebetween in said housing chamber;

a switch mechanism mounted in said opening in said peripheral wall of said housing; said switch mechanism including a switch actuator arm extending into said annular space and terminating in relatively close proximity to said central portion of said deformable cylindrical body;

a pair of piston members slidably and co-axially disposed within said chamber of said cylindrical housing;

each of said pistons having an inner end wall contacting one end of said deformable cylindrical body, whereby said cylindrical body may be compressed when said pistons move inwardly toward one another;

said central portion of said deformable body being enlarged in response to compression thereof by said pistons to move said switch actuating arm and operate said switching mechanism, and

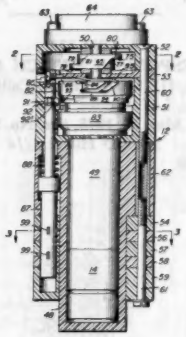
retaining means within said cylindrical body for retaining said pistons within said cylindrical housing.

4,051,339

VARIABLE TIME MISSILE SAFETY TIMER

Albert S. Will, Bethesda; Robert R. Wilson, Chillum, and Paul L. Culver, Ellicott City, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 28, 1964, Ser. No. 423,644
Int. Cl.² H01H *3/32*
U.S. Cl. 200—153 L **5 Claims**



1. A variable delay arming timer comprising

a cylindrical housing,

a motor and gearing contained within said housing,

a shaft coupled to said gearing to be rotated thereby at a predetermined rate, said shaft being coaxial with said cylindrical housing,

cam means mounted on said shaft for rotation therewith,

snap-action switch means carried by said housing and controlled by said cam means, said snap-action switch means having at least one spring biased actuating rod controlled between a retracted switch open position to an advanced switch-closed position by means of said cams, said rod being carried by said housing and being arranged in parallel relationship to said shaft and radially displaced from said shaft by a distance greater than the radius of said cylindrical housing, and

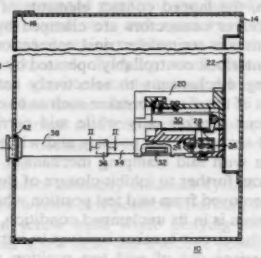
switch carrying discs surrounding said cylindrical housing in coaxial relation thereto, said discs carrying switch elements in position to be actuated by said actuating rods.

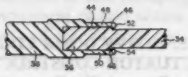
4,051,340

OVERLOAD RELAY RESET ASSEMBLY

Jerome C. Wolski, Downers Grove, Ill., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 26, 1976, Ser. No. 717,964
Int. Cl.² H01H *3/00*
U.S. Cl. 200—329 **11 Claims**





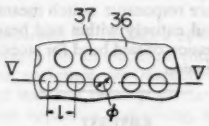
1. An electric control device comprising an enclosure including a rear wall, a front opening, and an access door for the front opening and having an aperture therein; a circuit interrupter mounted in the enclosure on the rear wall and spaced from the access door, the interrupter comprising relatively movable contacts, means for activating the contacts between open and closed positions and comprising a latch member movable between unlatched and latched positions corresponding respectively to the open and closed positions of the contacts, reset means for moving the latch member to the latched position and comprising a reset rod having an end portion spaced from the access door, an extension rod between said end portion and the access door, and the extension rod comprising one end detachably mounted on the reset rod and having another end located at the door aperture.

4,051,341

MICROWAVE OVEN DOOR SCREEN

Junzo Tanaka, Fujiidera, and Toshio Kai, Yamatokoriyama, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 3, 1976, Ser. No. 682,860
Claims priority, application Japan, May 20, 1975, 50-60693
Int. Cl.² H05B *9/06*
U.S. Cl. 219—10.55 D **3 Claims**



1. A microwave oven comprising a main body having a heating cavity therein, a door mounted to said main body for closing a front opening of said heating cavity, a microwave generator for radiating microwave energy into said heating cavity, and a door screen mounted on said door, said door screen including a punched metal plate interposed between transparent plates, said punched metal plate having a thickness of 0.10 to 0.35 mm, an aperture diameter of not larger than 1.2 mm and a ratio of the aperture diameter to a center-to-center distance of the apertures of 0.67 to 0.85, an extended portion of

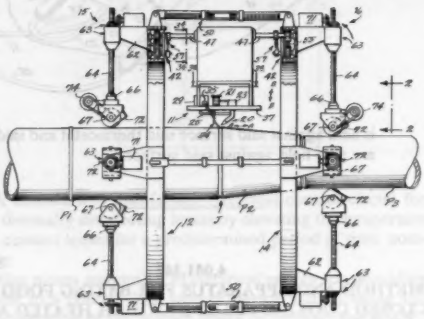
said punched metal plate being coupled to a metal plate which electrically couples the heating cavity body to the door body.

4,051,342

CONTINUOUS WELDER

James Henry Stubbings, Rockville, Md., assignor to Potomac Applied Mechanics, Inc., Bethesda, Md.

Filed Feb. 9, 1976, Ser. No. 656,590
Int. Cl.² B23K *9/02, 9/12*
U.S. Cl. 219—60 A **25 Claims**



1. A welding assembly for welding together adjacent ends at a joint of substantially horizontally disposed pipes of a horizontal pipeline comprising

a welding nozzle mounted exteriorly of pipes to be welded together,

means for mounting said welding nozzle exteriorly of pipes to be welded together for substantially 360° movement around said pipes to circumferentially weld adjacent pipes together,

means for supporting said welding nozzle mounting means for substantially horizontal movement on said pipes on the exterior thereof,

means for powering said support means for automatic movement of said welding nozzle from one joint between two pipes to another joint between two pipes along said pipelines, and

automatic adjustment means for mounting said supporting means so that said supporting means can adapt to pipes of different diameter automatically and so that transition pipes may be welded to pipes of different diameters at either end thereof.

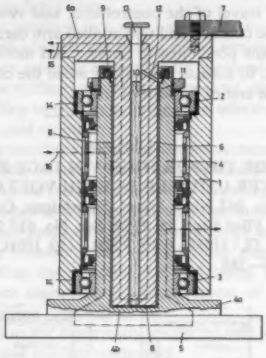
4,051,343

WELDING HEAD FOR RESISTANCE - WELDING MACHINE

Paul Opprecht, Im hinteren Bernold, 8962 Bergdietikon, Switzerland

Filed Dec. 4, 1975, Ser. No. 637,683
Claims priority, application Germany, Dec. 6, 1974, 2457684
Int. Cl.² B23K *11/06*
U.S. Cl. 219—84 **2 Claims**

1. A welding head adapted for use in a vertical orientation in resistance-welding machines utilizing a welding current, said head comprising a current lead. a housing adapted for the connection of said current lead, a vertical-axis rotor having a lower end and a body mounted rotatingly and non-displaceably in said housing, a roller electrode attached to said lower end of said rotor, and means for supplying said welding current to said roller electrode through said rotor body, said means comprising an interstice filled with mercury, said welding head further comprising a cylindrical central chamber having a wall surface and a base, the base being located adjacent said lower end and extending through almost the entire length of said rotor body, and a current-transmission rod secured to said housing and extending downwards through said central chamber almost to said base thereof, said interstice being formed within said cylindrical central chamber between said wall



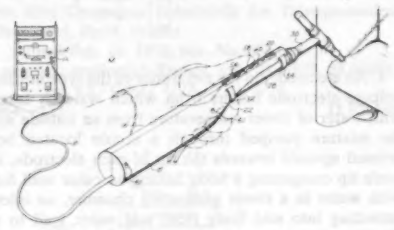
surface and base thereof and said current-transmission rod free of fluid seals adjacent the lower end portions of said interstice.

4,051,344

REMOTE CONTROL FOR AN ARC WELDING MACHINE

Dennis R. Robbins, 20134 2nd South, Seattle, Wash. 98148

Filed Apr. 28, 1975, Ser. No. 572,381
Int. Cl.² B23K *9/10*
U.S. Cl. 219—132 **4 Claims**



1. Remote-control mechanism for an electric welding torch, comprising:

an axially elongated body including a forward torch mounting portion and a handle forming portion, sized to be held in a user's hand, said body being longitudinally split into two parts which together define an inner cavity;

a linear potentiometer within said inner cavity, said linear potentiometer including an elongated housing including opposite side parts and a top wall which includes a longitudinal slot, and a sliding control member for said linear potentiometer movable between longitudinal end positions, including a control arm which projects outwardly through said slot;

said body parts including side recess means which are sized to snugly receive and hold said opposite side portions of said potentiometer housing when the two body parts are assembled about said potentiometer; and are positioned to orient the slot in the top wall of the potentiometer housing and the longitudinal path of travel of the control arm generally within the separation plane of the body parts;

said body parts including means defining an elongated slot generally at the separation plane of the body parts and forwardly of the location of the linear potentiometer;

a sliding external control member mounted on said body for movement longitudinally of said slot;

an elongated internal control link interconnected between said external control member and the control arm of the linear potentiometer, for moving the linear potentiometer between its longitudinal end portions in response to the

external control member being moved between its end positions by the user's hand; and

an off-on switch carried within said body at one end of the path of travel of the control arm, said switch including a movable contact, and said control arm carrying an actuating means positioned to contact and move said movable contact, to actuate the switch when the control arm is at said one end of its path of travel.

4,051,345

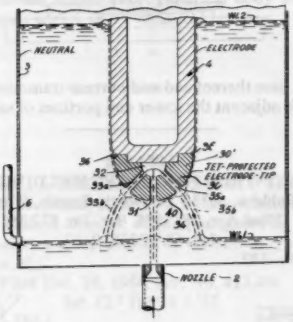
ELECTRODE TIP FOR HIGH VOLTAGE ELECTRODES OF THE TYPE UTILIZED IN HIGH VOLTAGE BOILERS

Milton Eaton, 363 Ninth Street, Shawinigan, Quebec, Canada

Filed Sept. 26, 1975, Ser. No. 617,152

Int. Cl.² H05B *3/60*; F22B *1/30*; H01C *10/02*

U.S. Cl. 219—288 **9 Claims**



1. An electrode tip for electrodes of the type utilized in high voltage electrode boilers from which water is taken, mixed with water of lower temperature from an outside source and the mixture pumped through a nozzle located below and pointed upward towards the tip of each electrode, said electrode tip comprising a body having an outer wall for contact with water in a steam generating chamber, an inlet passage extending into said body from said outer wall to a central chamber in said electrode tip and disposed on the central longitudinal axis of said electrode, at least two return passages extending from said central chamber to said outer wall of said body in a downward direction relative to said longitudinal axis of said electrode whereby water entering said central chamber of said electrode tip through said inlet passage in an upward direction is returned out of said central chamber of said electrode tip through said return passages to the space below the electrode tip where the cooling effect of the returned water limits the steam generation in said space below the electrode tip.

4,051,346

TANK HEATING AND CONTROL UNIT

Voigt O. Lenmark, 7505 Highway 7, Minneapolis, Minn. 55426

Filed Mar. 10, 1976, Ser. No. 665,513

Int. Cl.² H05B *1/00*; F24H *1/00*

U.S. Cl. 219—328 **7 Claims**

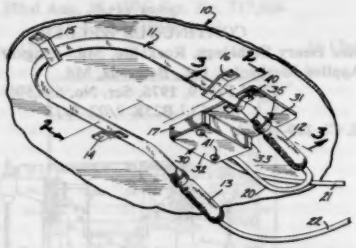
1. In a heating unit for application to the outer surface of a stock watering tank, comprising a substantially rigid linear heating element configured to be held in contact with said surface when brought into engagement with securing means depending therefrom, and a surface thermostat connected to control said element and having a flat face for thermal engagement with said surface, the improvement which comprises:

a mounting plate for said thermostat, including

a first portion to bear inwardly against said surface,

a second portion secured to said thermostat to bear inwardly thereagainst,

and means located between said portions for securing said plate directly to said element, so that when said element



is held against said surface said thermostat and said plate are also held against said surface.

4,051,347

METHOD AND APPARATUS FOR BAKING FOOD IN A CLOSED COOKING SPACE IN WHICH HEATED AIR IS CIRCULATED

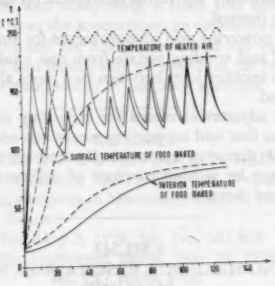
Franz Röhrl, Obing; Josef Ackermann, and Heinrich Detterbeck, both of Traunreut, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Division of Ser. No. 418,980, Nov. 26, 1973, Pat. No. 3,984,578. This application June 15, 1976, Ser. No. 696,436

Claims priority, application Germany, Nov. 24, 1972, 2257795; Feb. 8, 1973, 2306265; Oct. 18, 1973, 2352340

Int. Cl.² F27D *11/02*

U.S. Cl. 219—400 **17 Claims**



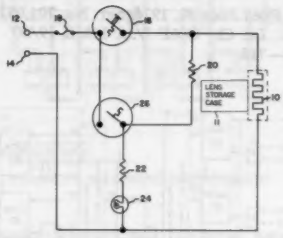
1. In an electric baking oven including a closed cooking space, and means for heating air and circulating heated air therewithin including a grill heater, the improvement comprising:

temperature control means, coupled to said grill heater, for coupling said grill heater to full line voltage and intermittantly activating said grill heater during the baking of food within said cooking space so that the surface temperature of said grill heater is raised to a value ranging between 600° C and 900° C for a predetermined period of time and thereby generates a plurality of sequential heat radiation pulses within said cooking space of a predetermined amplitude, frequency, and duration to vary the temperature of the heated air within said cooking space in sawtooth fashion about a mean temperature value ranging between about 120° and 160° C and to bake said food and to brown the surface thereof with minimum of soiling of said cooking space.

4,051,348
CONTACT LENS DISINFECTING CIRCUIT

Kurt H. Kreckel, Fairport, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed July 18, 1975, Ser. No. 597,124
Int. Cl.[2] H05B 1/02
U.S. Cl. 219—506 10 Claims



1. A contact lens disinfecting electrical control circuit for use in thermally disinfecting lenses by elevating the temperture of the contact lenses for a predetermined period of time, comprising:

heating means responsive to electrical energy for providing heat to a contact lens storage device and elevating the temperature of the contact lenses to disinfect the lenses;

indicator means for providing a readily detectable indication that during operation of the heating means the temperature of the contact lenses is elevated above ambient temperature;

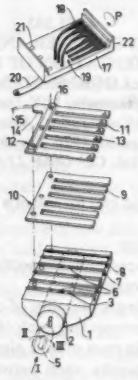
first control means including switching contacts for manual operation of the switching contacts to connect the heating means to an electrical source and for automatic operation of the switching contacts responsive to the heat provided to the contact lens storage device by the heating means to disconnect the heating means from the energy source; and

second control means for automatic operation responsive to the heat provided to the contact lens storage device by the heating means to energize the indicator means for a period of time after the heating means has been disconnected from the energy source.

4,051,349
RECORDING UNIT

Sven Englund, Ektorp, Sweden, assignor to Hugin Kassaregister AB, Stockholm, Sweden

Filed Mar. 18, 1976, Ser. No. 668,186
Int. Cl.[2] G06C 25/00
U.S. Cl. 235—130 R 7 Claims



1. A key-operated switch comprising:

a block having a bore therein;

a key-operated cylinder rotatably mounted in the bore of said block, said cylinder adapted to receive any of a plurality of associated keys,

a row of pins mounted in a row parallel to the axis of said cylinder and adapted for sliding radial movement within said cylinder, said pins adapted to be displaced and project beyond the surface of said cylinder, said displacements corresponding to the irregularities of a selected key when inserted in said cylinder;

a set of spring members including parallel sections of flexible wire mounted on said block, each of said wire sections extending across the path of travel of a corresponding one of said pins and in a direction transverse to said pin row;

a set of contact reeds mounted on said block and adjacent said spring member, each of said reeds aligned with a corresponding one of said pins and being adapted for displacement responsive to displacement of said corresponding spring member;

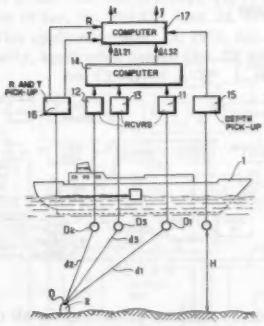
insulating means for electrically insulating said spring members from said contact reeds; and

a set of contact members fixedly mounted on said block and adjacent said contact reeds, each of said contact members being aligned with a corresponding contact reed, and being positioned to contact said corresponding contact reed displaced by said corresponding spring member when a key is inserted in said cylinder.

4,051,350
POSITION MEASURING DEVICE

Guy Parent, Le Plessis-Robinson, France, assignor to Societe Anonyme dite: Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Feb. 18, 1976, Ser. No. 659,061
Claims priority, application France, Feb. 27, 1975, 75.06084
Int. Cl.[2] G06G 7/22, 7/70, 7/78
U.S. Cl. 364—432 11 Claims



1. In a position measuring device enabling the calculating of the magnitudes proportional to the coordinates X and Y of a vessel which can move on the water in relation to two axes of orthogonal coordinates IX and IY, comprising a sound wave emitter placed at a point 0 situated, at the bottom of the water, at least three detectors D1, D2, D3 on the bottom of the vessel and arranged at the apexes of a triangle, IX being parallel to D2 D1 and the plane of the axes IX, IY being the plane of the triangle D1, D2, D3, the distance between the detectors D1, D2 being $2a$, the distance between the detectors D2, D3 being $2b$, the distance between the point 0 and the detector D1 being d_1, the distance between the point 0 and the detector D2 being d_2, the distance between the point 0 and the detector D3 being d_3;

Means for calculating the depth of water H below the vessel;

Means for calculating the difference in the travel time Δt_{21} of

the sound waves between **0** and **D2** on the one hand and **0** and **D1** on the other hand;

Means for calculating the difference in the travel time Δt_{32} of the sound waves between **0** and **D3** on the one hand and **0** and **D2** on the other hand; the improvement comprising:

First means (**18, 19**) supplying, on the basis of the difference in travel time Δt_{21}, by multiplication by a coefficient depending on the propagation speed c of sound waves in water, a signal xo equal to the difference between d_2 and d_1 and, on the basis of the difference in travel time Δt_{32} by multiplication by a coefficient depending on c, a signal yo equal to the difference between d_3 and d_2;

Second means (**20, 20'**) supplying, by algebraic multiplications and additions of the signals xo and d_1, a signal equal to kx, x being the distance of the point **0** in relation to the mid plane of **D1 D2**;

Third means (**30, 30'**) supplying, by algebraic multiplications and additions of the signals xo, yo and d_1, a signal ky, y being equal to the distance of **0** in relation to the mid plane of **D2 D3**;

Fourth means (**40**) supplying, on the basis of kx, the signal kX;

Fifth means (**50**) supplying, on the basis of the signals kx, ky, the signal kY;

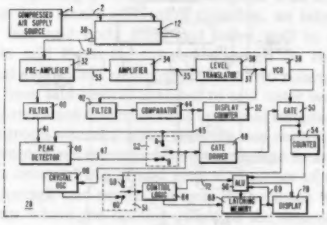
Sixth means (**60, 60'**) supplying, by algebraic multiplications and additions of the signals kx, ky and H, a signal equal to $k^2d_1^2$ which, after application to a square root extractor (**70, 70'**), is applied to the second and third means (**20, 20'**) (**30, 30'**).

4,051,351

ELECTRONIC SYSTEM FOR MONITORING PNEUMATIC TOOL PERFORMANCE

George T. Mallick, Jr., and Robert C. Miller, both of Penn Hills, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 10, 1976, Ser. No. 740,444
Int. Cl.[2] G06G *7/48;* G01L *23/00;* F15B *21/02*
U.S. Cl. 364—400 **16 Claims**



1. An electronic system for generating signals representative of the performance of a pneumatic tool during one or more work cycles wherein said pneumatic tool includes a working cylinder and gaseous actuating fluid contained therein, said electronic system comprising:

means to generate a signal in real time representative of the actuating gaseous fluid pressure in the work cylinder of said pneumatic tool;

first means to operate at times on said real time pressure signal only over a selected time portion of each of said work cycles for generating a signal representative of the energy developed in said pneumatic tool during said time portions; and

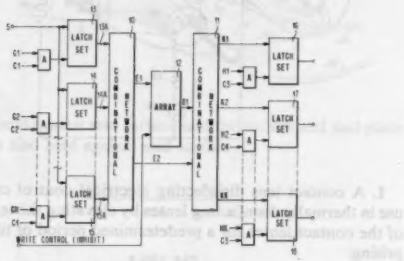
second means to operate at times on said real time pressure signal only over a selected time portion of each of said work cycles for generating a signal representative of the friction developed in said pneumatic tool during said time portions.

4,051,352

LEVEL SENSITIVE EMBEDDED ARRAY LOGIC SYSTEM

Edward Baxter Eichelberger, Purdy Station, N.Y.; Eugene Igor Muehldorf, Potomac, Md.; Ronald Gene Walther, Vestal, N.Y., and Thomas Walter Williams, Longmont, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1976, Ser. No. 701,052
Int. Cl.[2] G06F *7/38;* H03K *19/00*
U.S. Cl. 364—716 **16 Claims**



1. A level sensitive embedded array logic system fabricated by large scale integration techniques on a semiconductor chip: said system comprising:

means for generating a set of system input signals;

means for generating a plurality of clock signal trains having a predetermined duration between the occurrence of signals in successive trains;

a first group of latch circuit means connected to said means for generating said set of input signals and said means for generating said plurality of clock signals, said first group of latch circuit means receiving at least certain ones of said set of system input signals and selected ones of said clock signal trains;

a second group of latch circuit means including system output means, said second group of latch circuit means being connected to said means for generating said plurality of clock signal trains and receiving at least certain other selected ones of said clock signal trains;

combinational logic circuit means including at least one read/write array and said combinational logic circuit means connecting said first group of latch circuit means to said second group of latch circuit means.

4,051,353

ACCORDION SHIFT REGISTER AND ITS APPLICATION IN THE IMPLEMENTATION OF LEVEL SENSITIVE LOGIC SYSTEM

Hua-Tung Lee, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1976, Ser. No. 701,055
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—716 **17 Claims**

1. A functional logic unit for use in a digital computer or the like comprising:

a plurality of latches;

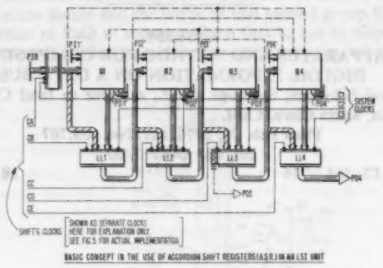
first connection means for connecting said latches into an accordion shift register;

means for generating a plurality of clock signal trains;

means selectively connecting each of said clock signal trains to at least certain ones of said plurality of latches;

a plurality of networks, each network receiving a binary input and providing a binary output bearing a fixed logical relationship to its binary input;

means selectively interconnecting at least certain ones of said latches with the input and output of selected ones of



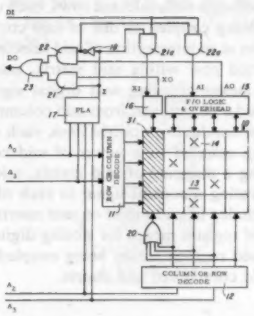
said networks, whereby said functional logic unit performs at least one predetermined logical function.

4,051,354

FAULT-TOLERANT CELL ADDRESSABLE ARRAY

William Clay Choate, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed July 3, 1975, Ser. No. 593,090
Int. Cl.[2] G11C *29/00, 8/00;* G06F *11/00*
U.S. Cl. 235—312 **54 Claims**



1. A defect-tolerant cell addressable array comprising:

a. an array of functional cells arranged in rows and columns;

b. cell selection means responsive to cell address code signals for selectively addressing an individual functional cell in a respective row and column;

c. a plurality of redundant functional cells;

d. memory means in which cell address codes of defective functional cells indicative of row and column locations are selectively storable, said memory means being responsive to said cell address code signals for detecting when the cell address code signals correspond to the address codes of defective ones of said functional cells and for generating a signal indicative thereof; and

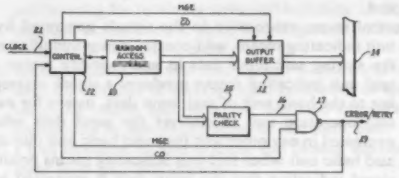
e. logic means responsive to the signal generated by said memory means for selecting a corresponding one of said redundant functional cells and for inhibiting the selection of the respective defective cell of said array.

4,051,355

APPARATUS AND METHOD FOR INCREASING THE EFFICIENCY OF RANDOM ACCESS STORAGE

Juei-po Lin, San Diego, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Apr. 29, 1976, Ser. No. 681,675
Int. Cl.[2] G11C *29/00*
U.S. Cl. 235—302.3 **9 Claims**



1. An improved method for receiving a message, having data bits therein, from a random access storage and transmitting said message, said data bits having a typical data bit delivery time and a worst case data bit delivery time, comprising the steps of:

a. storing said data bits in a buffer as they are received from a random access storage;

b. simultaneously transmitting said data bits from said buffer for a predetermined period of time ending after said worst case data bit delivery time;

c. checking the parity of said message as the data bits therein are stored in said buffer;

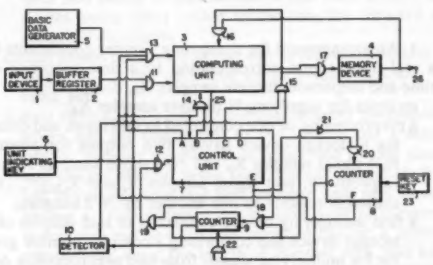
d. generating an error signal, when message is being transmitted to the bus and non-parity occurs.

4,051,356

KEYBOARD CONTROLLED DATA CONVERTER

Masayuki Hakata, Iruma, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 505,151, Sept. 11, 1974, which is a continuation of Ser. No. 299,823, Oct. 24, 1972, Pat. No. 3,855,459. This application Mar. 25, 1976, Ser. No. 670,424
Claims priority, application Japan, Oct. 23, 1971, 46-84187
Int. Cl.[2] G06F *5/00*
U.S. Cl. 235—310 **1 Claim**



1. Apparatus for converting input data expressed in units of scale-of-*m* into data expressed in units of scale-of-*n*, comprising:

data input means supplying data expressed in a basic unit of scale-of-*n* and data expressed in another unit of scale-of-*m*;

unit indicating means including a unit indication input key operated according to the unit of said data input;

means coupled to said unit indication input key for generating signals corresponding to the respective unit of said input data in accordance with the number of operations of said unit indication input key when the data expressed in the basic unit of scale-of-*n* and data expressed in the other

unit of scale-of-*m* are supplied to said unit indicating means;

data generating means for generating basic data used to convert said data expressed in the other units of scale-of-*m* to data expressed in the basic units of scale-of-*n*;

an operation unit connected to receive the data from said data input means and the basic data from said data generating means;

memory means for storing the output of said operation unit; and

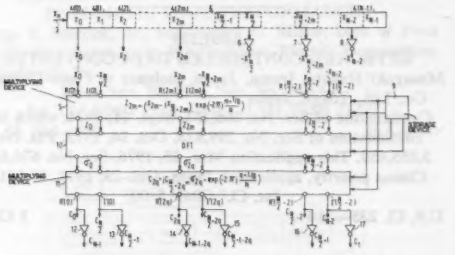
control means responsive to the signals generated by said unit indicating means, said control means including means for storing said input data in said memory means when said unit indicating means produces a signal corresponding to the basic unit of said input data, means for causing said operation unit to convert the input data which is expressed in any other unit than said basic unit into data of said basic unit when said unit indicating means produces a signal indicating that the input data is expressed in said other unit, means for causing said operation unit to add said converted data to said data which has been stored in said memory means, and means for storing the result of said addition in said memory means.

4,051,357

DOUBLE ODD DISCRETE FOURIER TRANSFORMER

Georges Bonnerot, L'Hay les Roses, France, assignor to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Mar. 1, 1976, Ser. No. 662,898
Claims priority, application France, Mar. 5, 1975, 75.06861
Int. Cl.[2] G06F *15/34*
U.S. Cl. 364—726 **6 Claims**



1. An arrangement for computing Fourier coefficients C_n of a real input signal corresponding to a time sequence of N time-and amplitude discrete samples X_k, comprising

an input for supplying N discrete samples X_k;

a preprocessing device connected to said input, and comprising a storage device having two outputs for producing N/4 signal samples X_i, and N/4 signal samples $X_{(N/2)+i}$ respectively, said signal samples X_i and $X_{(N/2)+i}$ being shifted in relation to one another by N/2 samples;

a first multiplying device connected to said outputs of said storage device and comprising a complex number generator for multiplying signals from said preprocessing device by predetermined complex numbers, and producing an output signal N/4 complex samples Z_i in response to the pairs of output samples X_i, $X_{(N/2)+i}$ of the storage device and the complex numbers generated by the complex number generator;

a DFT computer having an input connected to said output of said multiplying device and having an output for producing N/4 complex signals σ_q in response to the N/4 complex samples Z_i on said input; and

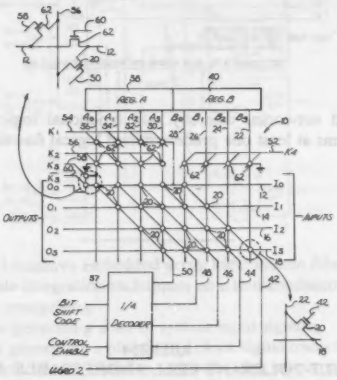
a second multiplying device and associated second complex number generator means connected to said output of said DFT computer for producing the real Fourier coefficients C_q and the real Fourier coefficients $C_{(N/2)+q}$ as real and imaginary part respectively of a complex number $C_q + jC_{N/2+q}$ in response to said signals σ_q and the complex numbers generated by said second complex numbers generating means.

4,051,358

APPARATUS AND METHOD FOR COMPOSING DIGITAL INFORMATION ON A DATA BUS

Samuel Schwartz, Saratoga, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Feb. 20, 1976, Ser. No. 659,767
Int. Cl.[2] G06F *7/00*
U.S. Cl. 364—716 **18 Claims**



1. A digital logic circuit for the manipulation of digital signals comprising:

an array of conductive lines forming a matrix of columns and rows;

a plurality of bidirectional coupling means for coupling selected columns with selected rows, each of said selected columns being coupled to one of said corresponding selected rows at an intersection of said selected column with said selected row within said matrix, said bidirectional coupling means coupling said digital signals from said rows to said columns, and from said columns to said rows:

a plurality of conductive control lines, each of said control lines being coupled to a subset of said coupling means lying along a diagonal of said matrix, said control lines communicating a control signal to each of said coupling means included in said subset on said matrix diagonal; and

a plurality of register means for storing digital information, each of said register means being coupled to a different one of said columns of said matrix.

4,051,359

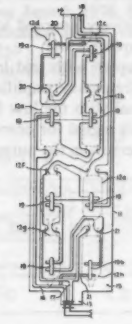
ELECTRIC MULTIPLE FLASH ARRANGEMENT

Heinz Streicher, Grotzingen, Germany, assignor to General Electric Company, Schenectady, N.Y.

Filed June 21, 1976, Ser. No. 697,981
Claims priority, application Germany, Aug. 27, 1975, 2538049
Int. Cl.[2] G03B *15/02*
U.S. Cl. 362—4 **2 Claims**

1. A multiple electric flash lamp array comprising a unitary structure having definable first and second regions, a first group of flash lamps in said first region and a second group of flash lamps in said second region, first and second electrical connector means forming a part of said structure and disposed in or adjacent to said first and second regions respectively, said first group of lamps being separated from said second connector means by said second region and said second group of lamps being separated from said first connector means by said first region, a first flash sequencing circuit connected between

said second connector means and the lamps of said first group for causing them to flash in sequence from first to last in response to flash signals applied to said second connector means, a second flash sequencing circuit connected between said first connector means and the lamps of said second group for causing them to flash in sequence from first to last in response to flash signals applied to said first connector means, wherein the



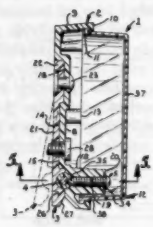
improvement comprises a first switching circuit for connecting flash signals applied to said first connector means to said second flash sequencing circuit after said last-to-flash lamp of the first group has been flashed, and a second switching circuit for connecting flash signals applied to said second connector means to said first flash sequencing circuit after said last-to-flash lamp of the second group has been flashed.

4,051,360

LAMP AND MOUNTING STRUCTURE THEREFOR

Charles A. Slater, Jr., Overland Park, Kans., and Spencer Darby, Kansas City, Mo., assignors to Peterson Manufacturing Company, Grandview, Mo.

Filed Mar. 17, 1976, Ser. No. 667,512
Int. Cl.² B60Q *1/00, 3/00, 11/00*
U.S. Cl. 362—363 **6 Claims**



1. A lamp assembly comprising:

a. a housing having a base wall of electrically non-conductive material and a side wall extending therefrom to define an open top compartment, said base wall having an exterior surface and a first recessed portion therein extending across said base wall, said base wall having an elongated channel in said first recessed portion for receiving therein an insulated conductor, said base wall having a second recessed portion extending laterally from said first recessed portion and having one end portion thereof spaced from said first recess;

b. a conductor retaining member having a first portion and a second portion received in said first and second recessed portions respectively of said housing base wall, said second portion having an end portion thereof secured to said base wall in spaced relation to said first portion, said first portion having an elongated channel therein in facing mating relation with said channel in said first recessed portion of said base wall to receive the insulated conductor in said channels, said conductor retaining member being of resilient electrically non-conductive material to normally retain the insulated conductor in the channels and permit said first portion of the retaining member to be moved away from said base wall of said housing to expose said channels for movement of the insulated conductor to and from said channels;

c. an electrical light bulb and means in the compartment of said housing for receiving same and including an electrical conductor connected to an electrical ground and having a terminal on one end thereof;

d. means mounted on said housing and in electrical contact with the terminal of said electrical conductor of said bulb receiving means and with the insulated conductor for completing an electrical circuit to said bulb; and

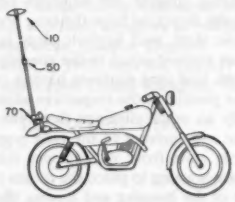
e. a lens mounted on said housing and closing the compartment with said bulb therein.

4,051,361

VEHICLE IDENTIFICATION SIGNAL DEVICE

James F. Lichon, 1116 River Forest Drive, Saginaw, Mich. 48603, and Charles Earl Cone, 5701 Woodview Pass, Midland, Mich. 48640

Filed Nov. 17, 1975, Ser. No. 632,396
Int. Cl.² B62J *5/00*
U.S. Cl. 362—211 **5 Claims**



1. For use with vehicles such as motorcycles or the like, a signal device comprising:

a casing having forward and rearward lamp sockets disposed thereon;

forward and rearward transparent domes detachably secured to said casing, each of said domes being cooperable with said casing to enclose one of said lamp sockets, said domes being color coded to indicate the forward and rearward directions;

circuit means connected at one end to said lamp sockets for connection at the other end to the vehicle indicator circuits; and

a mast having a first tubular member adapted proximate its lower end for attachment to the vehicle and a second tubular member secured at its upper end to said casing, said second member being telescopically extendible from and retractable into said first member, said first member having a knurl disposed on its inner wall proximate its upper end and said second member having a striation substantially along the length of its outer wall, said knurl being cooperable with said striation to prevent rotational motion of said second member in relation to said first member.

4,051,362

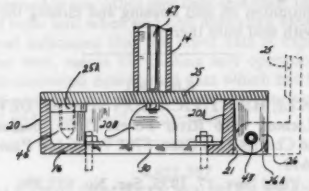
WALL MOUNTED HINGED BASE

Kenneth F. Guggemos, 135 Fairlawn Circle, Winsted, Minn. 55395

Filed Mar. 8, 1976, Ser. No. 664,511
Int. Cl.² F21S *13/10*; **F21V** *21/00*
U.S. Cl. 362—432 **10 Claims**

1. A hinged base assembly for mounting onto generally upright surfaces comprising a base housing including a base

wall having first means adapted to rest on an upright surface on which it is to be mounted, and a plurality of side walls attached to said base wall and extending outwardly therefrom to define an interior chamber having a depth extending from said first means to outer edges of said side walls, a cover member overlying the side walls, means to hingedly mount said cover member to said base housing adjacent one upright edge thereof about an upright axis, said side walls including two spaced, generally parallel side walls extending at right angles to said one upright edge, and mounting slot means defined in said base wall of said housing comprising at least four keyhole slots arranged in pairs, each pair being adjacent one of the two side walls of said base at right angles to said one upright edge, said keyhole slots each having a main aperture portion and a single bolt receiving tang portion of smaller transverse dimension



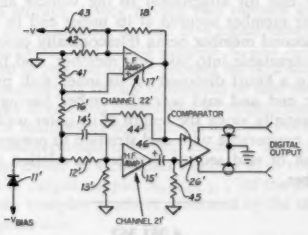
than said main aperture portion, the tang portions of each pair of slots extending toward the adjacent side wall only and facing in opposite direction from the tang portions of the other pair of keyhole slots, said keyhole slots in each pair being spaced apart an amount equal to the spacing of the other pair of keyhole slots, said tang portions having end surfaces aligning along a line parallel to the respective adjacent side wall and at substantially an equal distance from the side wall as the distance of the end surfaces of the tang portions of the other pair of keyhole slots from its adjacent side wall to permit rotating the base housing to place the means to hingedly mount on either side of the housing and having the tang portions of one pair of keyhole slots extending upwardly to form interchangeable support for the housing adjacent the upper of the two side walls.

4,051,363

SPLIT-PATH RECEIVER FOR FIBER OPTICS APPLICATION

Franklin H. Fish, Indianapolis, Ind., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 24, 1976, Ser. No. 670,013
Int. Cl.[2] H01S 3/02
U.S. Cl. 250—199 **2 Claims**



1. In an electro-optical transmission line, a receiver for converting light signals to electrical signals comprising,

a photodiode for receiving light inputs and having an output signal port for providing electrical signals having responses from direct current to a high frequency cut-off,

a first amplifier circuit channel connected to said output signal port of said photodiode comprised of a wide-bandwidth amplifier for amplifying the high frequency portion of a signal from said output signal port and providing an output,

a second amplifier circuit channel connected to the output signal port of said photodiode comprised of a low frequency amplifier for amplifying direct current and the low frequency portions of said electrical signals and providing an output,

a load resistor capacitively coupled to the output of said wide-bandwidth amplifier, and

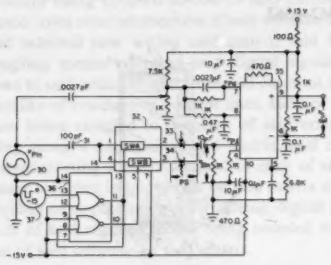
an error amplifier coupled with said load resistor and said output of said low frequency amplifier for comparing the high frequency signal with the low frequency signal and providing a feedback signal for correcting direct current and low frequency errors in the output of said wide-bandwidth amplifier.

4,051,364

PHOTOPARAMP ARRAY MULTIPLEXER

Michael K. Giles, China Lake, and Myren L. Iverson, Ridgecrest, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 6, 1976, Ser. No. 712,456
Int. Cl.[2] H04D 9/00
U.S. Cl. 250—199 **2 Claims**



1. A photoparamp array multiplexer comprising;

pump means for outputting pump energy at a predetermined frequency;

an array of photodiodes connected in parallel and having an input for receiving a modulated light signal, and outputs;

multiplexing means operatively connected between the output of said pump means and the input to each of said photodiodes;

demodulating means operatively connected to the outputs of the photodiodes and having an output therefrom corresponding to the output signal of the photodiodes;

a multiplexing pulse input operatively coupled to said multiplexing means to cause said multiplexing means to couple the output of said pump means to the input of each of said photodiodes one at a time;

whereby the output of said demodulating means corresponds to the amplified output of an individual photodiode as determined by said multiplexing means.

4,051,365
PHOTOELECTRIC DETECTOR HAVING AN INDICATOR FOR INDICATING THE OPERATING CONDITION THEREOF

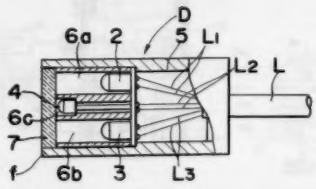
Toshifumi Fukuyama; Yasunori Asakura, and Norio Onji, all of Nagaokakyo, Japan, assignors to Omron Tateisi Electronics Co., Japan

Continuation of Ser. No. 493,157, July 30, 1974, abandoned. This application June 2, 1976, Ser. No. 692,148

Claims priority, application Japan, Aug. 8, 1973, 48-93679[U]; Aug. 13, 1973, 48-90759

Int. Cl.[2] **G01D** *21/04*

U.S. Cl. 250—222 R **15 Claims**



1. A photoelectric detector having an indicator for indicating the operating condition thereof which comprises a housing, and at least a light ray projecting element and a light ray receiving element received in corresponding bores formed in said housing with front surfaces of said projecting element and said receiving element spaced away from a light ray receiving front surface of said housing by a predetermined distance so that each of said bores forms a passage of light rays between said light ray receiving front surface of said housing and each of said front surfaces of said projecting element and said receiving element, said bores for receiving said light ray projecting and receiving elements being in parallel to one another and said distance between said front surface of said housing and each front surface of said elements being determined in such an extent that an optimum angle of directivity of said detector can be obtained with any light rays due to irregular reflection prevented from reaching said light ray receiving element, and with only light rays emitted by said light ray projecting element and reflected by an object to be detected reaching said light ray receiving element, and said photoelectric detector being further provided with a third bore in parallel to and in spaced relation to said bores for said projecting element and said receiving element, said third bore receiving therein a luminescent element for indicating the operating condition of said photoelectric detector at a position visible at the front surface of said housing.

4,051,366
OPTICAL APPARATUS FOR SENSING CLUSTERED PACKAGE ORIENTATION

Jason Morse Gordon, Katonah, N.Y., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 31, 1975, Ser. No. 645,590

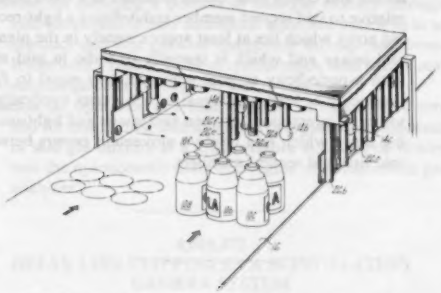
Int. Cl.[2] **H01J** *39/12*

U.S. Cl. 250—223 B **8 Claims**

1. A subassembly for optically sensing the orientation of a plurality of labeled containers spinning, on axes, at respective stations on an associated container handling assembly, comprising:

a plurality of light sources disposed substantially in a first plane, there being fewer of said light sources than containers illuminated thereby;

a plurality of optical sensors thus disposed in longitudinally extending tubular housings mounted with their axes parallel to the spin axes of the containers, one for each of the containers, each having an optically-sensitive aperture focused at a spot substantially in the path of the peripheral surface of a related rotating container and in a plane separated from said first plane by a distance which is sufficiently great so as to render said sensors substantially insensitive to specular reflection of light reflecting from



containers illuminated by said light sources, yet sufficiently small so as to render said sensors substantially sensitive to diffuse reflection of light reflecting from labels on the containers illuminated by the light sources.

4,051,367
MEASUREMENT APPARATUS

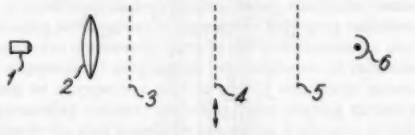
Leonard Alfred Sayce, decreased, late of Glasgow, Scotland, by Ethel Margaret Lindsay Sayce, executrix; Robert Martin Pettigrew, Carluke, Scotland, assignors to National Research Development Corporation, London, England

Filed Mar. 6, 1975, Ser. No. 555,817

Claims priority, application United Kingdom, Mar. 15, 1974, 11598/74

Int. Cl.[2] **H01J** *3/14*

U.S. Cl. 250—237 G **23 Claims**



1. An apparatus for measuring displacement of a first member relative to a second member in a manner corresponding to motion with one degree of freedom in a given plane, said apparatus comprising:

a substantially planar grating mounted in a fixed position relative to said first member so as to lie substantially in a first plane parallel to said given plane, said grating having lines which are spatially periodic in the sense of said motion and having a given pitch, the spatial periodicity of said grating in said sense being denoted by f_1;

means for illuminating said grating diffusely with light and comprising means mounted in a fixed position relative to said second member and defining an optical object which lies substantially in a second plane parallel to said given plane and is spatially periodic in said sense, the spatial periodicity of said object in said sense being denoted by f_2 and being less than $2f_1$, the spacing between said first plane and said second plane being denoted by u, and said light including light of at least one given wavelength such that the product of that given wavelength and u is not less than half the square of said pitch, for causing said grating to form a substantially planar image of said object extending substantially parallel to said given plane at a spacing v from said first plane effectively determined by the equation $f_2/f_1 = 2v/(u+v)$, said image being spatially periodic in said sense with a periodicity f_3 effectively determined by the equation $f_3/f_1 = 2u/(u+v)$ and moving in said manner relative to said second member when relative

movement in said manner occurs between said first and second members; and

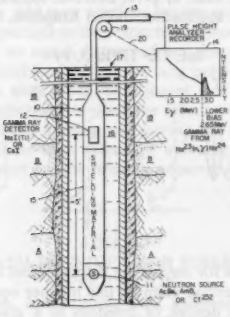
photodetector means responsive to light of said given wavelength and comprising means mounted in a fixed position relative to said second member and defining a light-receiving array which lies at least approximately in the plane of said image and which is spatially periodic in said sense with a periodicity at least approximately equal to f_3 for producing at least one signal which varies cyclically by virtue of interaction between said image and light-receiving array which said relative movement occurs between said first and second members.

4,051,368

METHOD OF MEASURING HORIZONTAL FLOW SPEED OF FLUIDS IN EARTH FORMATIONS PENETRATED BY A WELLBOREHOLE

Dan M. Arnold; Hans J. Paap, and Hubert D. Scott, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed June 21, 1976, Ser. No. 698,394
Int. Cl.² G01V *5/00*
U.S. Cl. 250—270 **10 Claims**



1. A method for determining the location and flow rate of earth formation fluids moving in a horizontal direction past a well borehole, comprising the steps of:

irradiating the earth formations in the vicinity of a well borehole with fast neutrons for a predetermined length of time to neutron activate at least one selected tracer element having a known radioactive half life and comprising a portion of the earth formation fluid moving past a well borehole;

moving a gamma ray detector past the earth formation which has been irradiated and detecting a first count rate signal representative of gamma radiation caused by the radioactive decay of said selected tracer element;

waiting a predetermined selected length of time and then again moving said gamma ray detector past the earth formation which has been irradiated and detecting a second count rate signal representative of gamma radiation caused by the radioactive decay of said selected tracer element; and

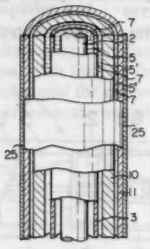
combining said first and second count rate signals according to a predetermined relationship to derive an indication of the horizontal flow rate of earth formation fluid past the well borehole.

4,051,369

METHOD FOR INSPECTING NUCLEAR FUEL ROD OR IRRADIATION CAPSULE

Isao Takeshita, Oarai, Japan, assignor to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Feb. 6, 1975, Ser. No. 547,743
Claims priority, application Japan, Feb. 9, 1974, 49-16686
Int. Cl.² G03B *41/16*
U.S. Cl. 250—321 **6 Claims**



1. A method for inspecting a nuclear fuel rod, said method comprising:

providing a nuclear fuel material enclosed within a sleeve with a gap therebetween;

filling said gap with a heat transfer medium including a liquid metal uniformly admixed with a radioactive element;

winding a film which is sensitive to said radioactive element around said sleeve, and allowing said film to be exposed to said radioactive element through said sleeve; and

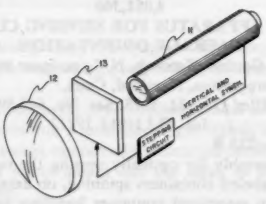
developing said film and detecting the condition of said film, after exposure to said radioactive element, to determine areas of said film not exposed to said radioactive element, as indications of the location of the level of said heat transfer medium within said nuclear fuel rod and of the existence of voids in said heat transfer medium within said gap.

4,051,370

OPTICAL SYSTEM FOR THERMAL IMAGER

Vincent T. Bly, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 24, 1976, Ser. No. 717,080
Int. Cl.² H01J *31/50*; G02F *1/13*
U.S. Cl. 250—331 **7 Claims**



6. A method of detecting a light image from a distant object comprising the steps of:

projecting light received from said object onto the target of a pyroelectric vidicon tube;

scanning said target with at least one beam of electrons; and

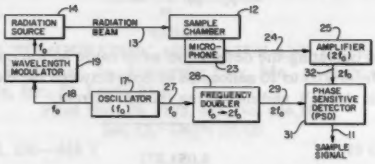
periodically focussing and defocussing said light at individual portions of said target such that said portions are focussed for a storage period commencing prior to and including any readout period when they are being scanned

by an electron beam and are defocussed for a given period between each of said storage periods.

4,051,371
OPTO-ACOUSTIC SPECTROSCOPY EMPLOYING AMPLITUDE AND WAVELENGTH MODULATION

C. Forbes Dewey, Jr., Belmont, and Lon O. Hocker, Newton, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 26, 1976, Ser. No. 680,622
Int. Cl.² G01N *21/26*
U.S. Cl. 250—339 16 Claims



1. Apparatus for detecting the presence of a species in a medium comprising,

means defining a sample chamber for receiving said medium,

a source of a beam of radiant energy incident upon said sample chamber for producing pressure waves therein of intensity related to the degree of absorption by said medium,

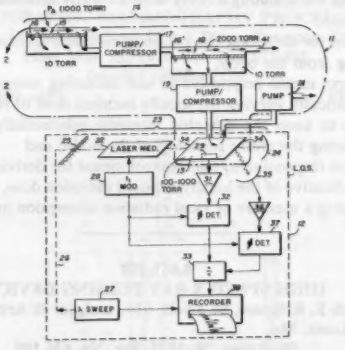
means modulating the wavelength of said radiant energy through a wavelength range including a spectral line characteristic of said species at a rate corresponding to a wavelength modulation frequency,

and first acoustical detecting means for detecting the intensities of individual frequency components of said pressure wave signals produced in said sample chamber to provide an output signal representative of the degree of absorption of the medium in said sample chamber.

4,051,372
INFRARED OPTOACOUSTIC GAS ANALYZER HAVING AN IMPROVED GAS INLET SYSTEM

Harry E. Aine, 1804 Stierlin Road, Mountain View, Calif. 94040

Filed Dec. 22, 1975, Ser. No. 643,179
Int. Cl.² B01D *53/22;* G01J *1/00, 3/42;* G01V *9/00*
U.S. Cl. 250—343 21 Claims



1. In an inlet system for introducing gaseous material from a source into the optoacoustic region of an infrared optoacoustic gas analyzer:

membrane separator means having a membrane of the type which has a higher value of diffusion conductance to a first gaseous component than to a second gaseous component of the gas mixture to be analyzed and is dimensioned and arranged for diffusion therethrough of amounts of said first gaseous component at a sufficient rate for detection in the optoacoustic detector region;

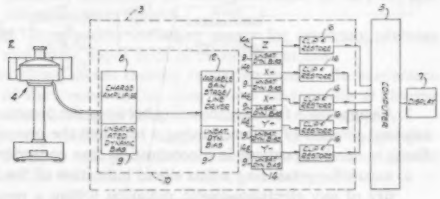
means for diffusing a portion of said gas mixture through said membrane of said membrane separator means so as to conduct said first gaseous component through said membrane with a higher value of conductance than that of said second gaseous component; and

means for operation at a total pressure in excess of 10 torr and for conducting said separated first gaseous component of said gas mixture at a total pressure in excess of 10 torr into the optoacoustic detection region of optoacoustic gas analyzer.

4,051,373
DELAY LINE CLIPPING IN A SCINTILLATION CAMERA SYSTEM

Kenneth F. Hatch, Prospect, Conn., assignor to Picker Corporation, Cleveland, Ohio

Continuation of Ser. No. 478,200, June 11, 1974, abandoned.
This application July 28, 1975, Ser. No. 599,657
Int. Cl.² G01T *1/164, 1/20*
U.S. Cl. 250—363 S 17 Claims

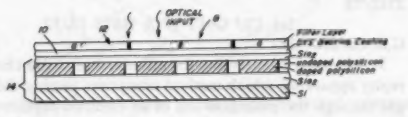


1. In a scintillation camera system having scintillator means for producing scintillations in response to impinging radiation, light responsive means responsive to the scintillations for generating sequences of data signals representative of radiation impinging on a respective portion of said scintillator means, signal processing circuitry including pulse shaping circuitry responsive to the data signals for generating a plurality of data pulses defining the situs of respective scintillations and a display mechanism for producing images representing the radiation impinging on the scintillator means, the improvement wherein the pulse-shaping circuitry comprises a compensating circuit means including circuitry coupled to produce and combine first signals representing data signals and second signals representing data pulses for decreasing base line fluctuation of the data pulses and thereby improving pulse detection.

4,051,374
IMAGING DEVICE HAVING IMPROVED BLUE RESPONSE

Karl Heinz Drexhage, Rochester, and Robert Lewis Lamberts, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 4, 1976, Ser. No. 693,233
Int. Cl.² G01J *1/58*
U.S. Cl. 250—370 13 Claims



1. In a silicon imaging device of the type adapted to convert a visible light image directed into a face thereof to electrical signal form and having a sensitivity characteristic that gener-

ally increases with wavelength over the visible spectral range, the improvement comprising:

a dye-bearing layer superposed over said face, the dye thereof being of a type that fluoresces by absorbing short wavelength visible light and in response thereto emits longer wavelength visible light which is within the operative range of said imaging device, said layer being substantially transparent to green and red light whereby short visible wavelength response is effectively upgraded without degrading green or red response.

4,051,375

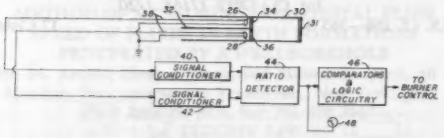
DISCRIMINATING FLAME DETECTOR

Adolph August Schuetz, East Hampton, and Gary Edward Bosak, Bristol, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 2, 1976, Ser. No. 646,087

Int. Cl.[2] G01J *1/42*

U.S. Cl. 250—372 **8 Claims**



1. An apparatus for discriminating between the presence in a selected position of a flame having a base and the presence of flame in nearby locations in a combustion area comprising:

a. means for producing a first signal indicative of the intensity of any electromagnetic radiation within a predetermined first spectrum which reaches it from locations in a path comprising a set of locations which includes the location at which the base of the flame to be detected will occur if the flame is in the selected position and excludes the locations at which bases of the flames in the nearby locations will occur;

b. means for producing a second signal indicative of the intensity of any electromagnetic radiation within at least one predetermined second spectrum which reaches it from locations in the path; and

c. means receiving the first and second signals for producing a signal indicative of the ratio of the radiation intensities represented by the signals which it receives, the ratio indicating the presence of flame in the selected position when the ratio is within predetermined limits and indicating the absence of flame or the malfunction of the apparatus when the ratio is outside the limits.

4,051,376

IONIZATION DETECTORS

Edgar Adolf Lorch, and David John Dwight, both of Amersham, England, assignors to The Radiochemical Centre Ltd., England

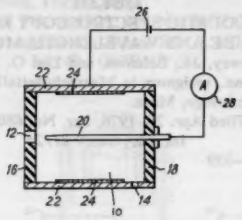
Filed Jan. 26, 1976, Ser. No. 652,579

Claims priority, application United Kingdom, Jan. 28, 1975, 3742/75

Int. Cl.[2] G01T *1/18;* H01J *17/32*

U.S. Cl. 250—381 **5 Claims**

5. A method of analysing the effluent from a gas chromatography apparatus, which method comprises passing the effluent gas through the ionisation cell of an electron capture detector having entry and exit ports for gas and a pair of electrodes defining between them a region for the passage of gas to be analysed, the pair of electrodes being positioned so that gas flowing through the cell passes through the region between them, and a source of iron-55 emitting electrons into the said region and thereby causing ionisation of gas in the said region,



and operating the detector so as to cause an ion current of from 0.05 to 10 nanoamps to flow between the electrodes in the cell, and measuring the ion current.

4,051,377

SCANNING X-RAY EXAMINATION APPAPATUS

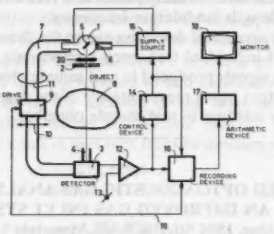
Rudolf Kemner, and Frans Wessel Zonneveld, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 18, 1975, Ser. No. 642,159

Claims priority, application Netherlands, Dec. 23, 1974, 7416756

Int. Cl.[2] H05G *1/34*

U.S. Cl. 250—401 **9 Claims**



1. A device for measuring local radiation absorption differences in a body, comprising:

means for scanning a body with a locally incident radiation beam;

means for detecting the resulting radiation intensity emerging from the body;

control means responsive to said detecting means for automatically varying the locally incident dose of radiation so as to keep the detected intensity substantially constant during the entire scanning of the body; and

means responsive to said control means for deriving a signal indicative of the locally incident radiation dose, said signal being a measure of local radiation absorption in the body.

4,051,378

HIGH SPEED X-RAY PULSING DEVICE

Kenneth E. Krippner, St. Louis, Mo., assignor to Artronix, Inc., St. Louis, Mo.

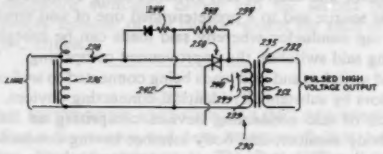
Filed Nov. 28, 1975, Ser. No. 636,100

Int. Cl.[2] H05G *1/10*

U.S. Cl. 250—421 **7 Claims**

1. An apparatus for examining an object by radiation having a source of radiation and means to generate radiation from that source, the means to generate radiation including a high voltage transformer to supply a pulsed, high-voltage output to the radiation source to rapidly pulse the radiation generated from

the source of radiation, the high voltage transformer having means to pulse a low voltage input to the high voltage transformer for one cycle of the input voltage and having means to apply a low direct current bias to the high voltage transformer.

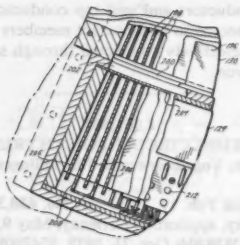


4,051,379

AXIAL TOMOGRAPHIC APPARATUS AND DETECTOR

Albert R. Zacher, Jr., University City, Mo., assignor to Artronix, Inc., St. Louis, Mo.

Filed Nov. 28, 1975, Ser. No. 636,104
Int. Cl.[2] G01N *23/00*
U.S. Cl. 250—445 T **10 Claims**



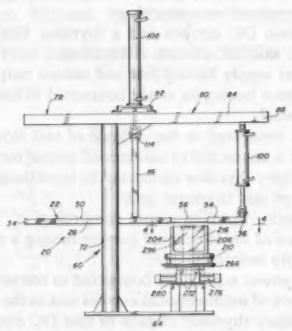
1. An apparatus for examining an object by radiation having a source of radiation and spaced detector elements and having means rotating the source of radiation about the object, the apparatus having means placing the detector elements so that a beam portion of radiation projected from the source of radiation and passing through the axis of rotation passes asymmetrically between adjacent detector elements.

4,051,380

APPARATUS AND METHOD FOR SUPPORTING AND POSITIONING THE BODY TO FACILITATE RADIOGRAPHIC MAMMOGRAPHY PROCEDURES

Harold J. Lasky, 2756 Euclid Park Place, Evanston, Ill. 60202

Filed Mar. 31, 1976, Ser. No. 672,303
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—451 **19 Claims**



1. The combination with radiation apparatus including a radiation source for presentation to body tissue to be examined, and means responsive to radiations from said radiation source to provide a visual image of said tissue, of a shiftable cradle for manipulatively supporting a female subject in a prone position to facilitate the gravitational suspension of the subject's breast in diverse selectible depending angles relative to the body of the subject,

said cradle comprising an elongated frame including a pair of opposed, coextensive, generally parallel bar means, and strut means retaining said bar means apart and fixed relative to each other to maintain a spacial span therebetween,

body-support sling means bridging said parallel bar means and secured thereto along the opposed lengths thereof,

said sling means being formed with an open areal section extending at least partially transversely thereacross at a position intermediate forward and rearward extremities of said frame,

said open areal section being adapted to receive therethrough a gravitationally suspended breast depending from the body of a subject supported on said sling means to present the breast into a zone below said cradle and accessible to a radiated beam eminating from the radiation source and directed toward the breast,

frame tilting means operatively connected to said frame for arcuately adjustably pivoting said frame to vary the spacial orientation thereof,

said tilting means including means for arcuately pivoting said frame about each of two different axes,

said tilting means thereby rendering feasible the suspension of the breast in the zone below said cradle at diverse selectible angles relative to the body of the subject,

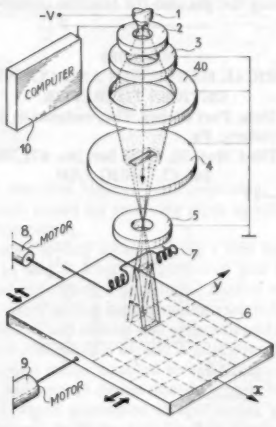
whereby fidelity and diagnostic value of film images produced in radiographic mammography procedures carried out on the breast of the subject are enhanced.

4,051,381

DEVICE FOR THE PROGRAMMED TRACING OF DESIGNS BY PARTICLE BOMBARDMENT

Jacques Trotel, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 9, 1975, Ser. No. 639,105
Claims priority, application France, Dec. 13, 1974, 74.41130
Int. Cl.[2] H01J *29/00*
U.S. Cl. 250—492 A **6 Claims**



1. An automatic device for forming programmed patterns upon a substrate, comprising an electron optical system, for forming an electron beam, means for deflecting said beam, a control electrode for controlling its intensity by all or nothing fashion, a data processing system for controlling said deflect-

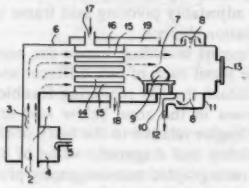
ing means and said control electrode, said device comprising upon the beam trajectory, a diaphragm in order to delimit the beam trajectory, and a lens for projecting onto the substrate a very small scale image of said diaphragm, said deflection means making it possible to displace said image, in order to scan said substrate line by line parallel to a first direction Ox, motor displacing means, actuated by said data processing system, for scanning the substrate line by line, by displacement of the substrate in a second direction Oy, perpendicularly to the first, by all or nothing control of the beam causing said pattern to be formed line by line by the succession of exposed and unexposed areas.

4,051,382

ACTIVATED GAS REACTION APPARATUS

Kazuyuki Ogawa; Masahiko Hirose, both of Yokohama; Masaaki Yada, Kawasaki, and Hitoshi Imamura, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed July 15, 1976, Ser. No. 705,695
Claims priority, application Japan, July 18, 1975, 50-87236
Int. Cl.² B01K *1/00*
U.S. Cl. 250—531 **7 Claims**



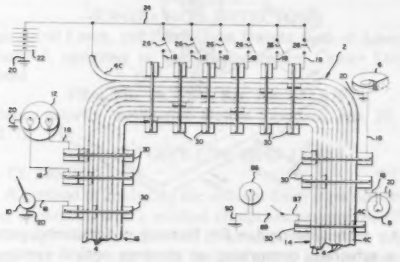
1. A gas reaction apparatus comprising:
an activation chamber having a gas inlet and outlet;
means for introducing a gas into the activation chamber through the inlet;
means for activating the gas in the activation chamber by electric discharge;
a reaction chamber positioned downstream of the activation chamber for providing a reaction with the gas;
means positioned between the activation chamber and the reaction chamber for changing the temperature of the activated gas supplied from the activating means and for introducing the gas into the reaction chamber.

4,051,383

ELECTRICAL HARNESSES AND CONNECTING DEVICES THEREFOR

Frank Peter Dola, Port Richey, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 30, 1976, Ser. No. 671,786
Int. Cl.² H02G *3/00*
U.S. Cl. 307—11 **14 Claims**



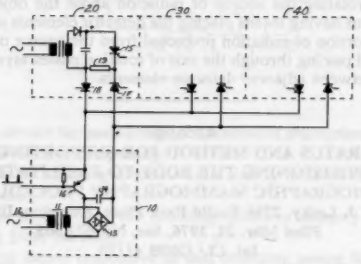
8. In an electrical harness of the type comprising a plurality of insulated conductors, a plurality of electrical loads, a plurality of switches, and a power source, each of said loads being connected to a predetermined one of said conductors by a load conductor and each of said switches being connected to said power source and to a predetermined one of said conductors by a tap conductor whereby said loads can be energized by closing said switches, the improvement comprising:
said switches and said loads being connected to said conductors by substantially identical connecting devices,
each of said connecting devices comprising an insulating body member, said body member having conductor supporting surface portions; said conductors being supported on said conductor supporting surface portions in side-by-side parallel relationship, said conductors having electrically exposed portions which are selectively located adjacent to said conductor supporting surface portions of said connecting devices,
a metallic contact member on each of said body members, each of said contact members extending transversely across its associated body member with said conductors between said contact members and said supporting surface portions, each of said contact members being in electrical contact with one of said electrically exposed portions of one of said conductors, and
said load conductors and said tap conductors being selectively connected to said contact members whereby
said loads are selectively connected through said switches to said power source.

4,051,384

BLOCKING CIRCUIT FOR THYRISTORS

Werner Ansorge, Vogelbeerweg 3, 733 Villingen, Black Forest, Germany

Filed Feb. 17, 1976, Ser. No. 658,382
Claims priority, application Germany, May 9, 1975, 2520626; June 12, 1975, 2526304; Oct. 21, 1975, 2547009
Int. Cl.² H02J *1/06*
U.S. Cl. 307—18 **7 Claims**



1. The combination comprising:
at least two DC circuits and a thyristor blocking circuit, each of said DC circuits comprising:
a power supply having first and second output terminals;
a thyristor having its anode connected to said first output terminal;
a load connected to the cathode of said thyristor, which load is connected to said second output terminal, and an auxiliary thyristor connected by its cathode to the cathode of said thyristor; and,
said thyristor blocking circuit comprising:
a source of unidirectional current having a pair of power supply terminals;
a first power supply line connected to one terminal of said source of unidirectional current and to the anode of said auxiliary thyristor of each of said DC circuits;
capacitive reactance means connected across both sides of said source of unidirectional current;

a semi-conductor switching device coupled to the other side of said capacitive reactance means; and

a second power supply line coupled between said semiconductor switching device and the second power supply terminal of the current source for each of said DC circuit.

4,051,385

ACTIVE NETWORKS AND SIGNALLING EQUIPMENT

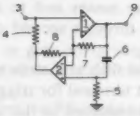
Philip Ernest Greenaway, and John Mortimer Rollett, both of London, England, assignors to The Post Office, London, England

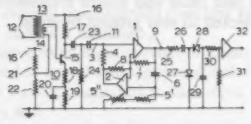
Filed June 9, 1976, Ser. No. 694,290

Claims priority, application United Kingdom, June 11, 1975, 25103/75

Int. Cl.[2] H04M *1/00;* **H03H** *7/02, 11/00*

U.S. Cl. 307—233 R **6 Claims**





1. An active network incorporating a gyrator, having a first and a second operational amplifier each said operational amplifier having an inverting input and a non-inverting input, the inverting inputs of said first and said second operational amplifiers being directly connected, and wherein the outputs of each of said first and said second operational amplifiers are resistively connected to the inverting inputs of their respective operational amplifiers, an input terminal connected to said non-inverting input of said first operational amplifier which said input terminal is connected resistively to said output of said second operational amplifier, said output of said first operational amplifier is capacitively coupled to said non-inverting input of said second operational amplifier and said non-inverting input of said second operational amplifier is resistively connected to earth.

4,051,386

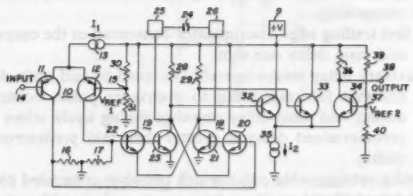
FREQUENCY DOUBLING CIRCUIT

David K. Long, and Robert W. Miller, both of Sunnyvale, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed July 22, 1976, Ser. No. 707,729

Int. Cl.[2] H03K *1/16*

U.S. Cl. 307—271 **5 Claims**



1. A frequency doubling circuit having an input for accommodating an input signal, including driver means responsive to said input signal for operating said circuit and means for coupling said circuit to first and second power supply terminals, said circuit comprising:

a capacitor having first and second terminals;

a first switching transistor having a collector coupled to said first capacitor terminal, an emitter coupled to said first power supply terminal, and a base coupled to said driver means;

a second switching transistor having an emitter coupled to said second capacitor terminal, a collector coupled to said second power supply terminal and a base coupled to said base of said first switching transistors;

a third switching transistor having a collector coupled to said second capacitor terminal, an emitter coupled to said first power supply terminal and a base coupled to said driver means;

a fourth switching transistor having an emitter coupled to said first capacitor terminal, a collector coupled to said second power supply terminal, and a base coupled to said base of said third switching transistor;

resistive means coupling each terminal of said capacitor to said second power supply terminal;

means in said driver means for driving said fist and second switching transistor bases in phase opposition to said third and fourth switching transistor bases in response to said input signal; and

output logic means coupled to said terminals of said capacitors whereby two output pulses are produced for each cycle of said input signal.

4,051,387

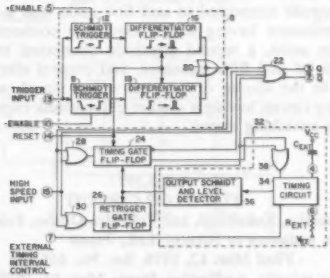
HIGH SPEED ECL ONE-SHOT MULTIVIBRATOR

Stephen Read Black, Bountiful, Utah, assignor to Motorola, Inc., Schaumburg, Ill.

Filed July 1, 1976, Ser. No. 701,722

Int. Cl.[2] H03K *3/10, 5/04*

U.S. Cl. 307—273 **9 Claims**



1. An ECL one-shot logic circuit comprising:

a. input circuit means for receiving input signals and having at least one output,

b. timing gate flip-flop means having a first input terminal coupled to said at least one output of said input circuit means and generating a first digital control signal,

c. retrigger gate flip-flop means having a second input terminal coupled to said at least one output of said input circuit means and generating a second digital control signal,

d. timing circuit means coupled to and being responsive to said first and second digital control signals for providing an output which is coupled to said timing gate flip-flop means and said retrigger gate flip-flop means for controlling output pulse length of said one-shot, and

e. output gate means for generating an output for said one-shot logic circuit and being responsive to and coupled to said input circuit means and to said first and second digital control signals.

4,051,388

FLIP-FLOP ACCOMPANIED BY TWO CURRENT SWITCHES, ONE HAVING A SMALLER CURRENT SINK CAPABILITY THAN THE OTHER

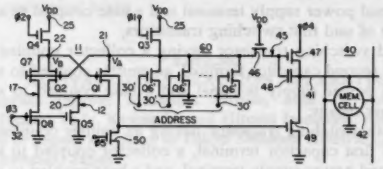
Hidemori Inukai, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Japan

Filed Apr. 29, 1976, Ser. No. 681,601

Claims priority, application Japan, May 7, 1975, 50-55723

Int. Cl.[2] H03K *3/286, 3/353, 19/34*

U.S. Cl. 307—279 **8 Claims**



1. A circuit arrangement comprising: a flip-flop circuit including a first field-effect transistor having a first electrode connected to a common point, a second electrode connected to a first node, and a control electrode connected to a second node, a second field-effect transistor having a first electrode connected to said common point, a second electrode connected to said second node, and a control electrode connected to said first node, and a third field-effect transistor having a first electrode connected to a reference point, a second electrode connected to said common point, and a control electrode connected to a source of an activation signal; precharge means connected to said first and second nodes for rendering said first node voltage higher than said second node voltage when said flip-flop circuit is in quiescent state; a first current switching circuit including a fourth field-effect transistor having a first electrode connected to said reference point, a second electrode connected to said first node, and a control electrode connected to an input terminal; and a second current switching circuit including a fifth field effect transistor having a first electrode, a second electrode connected to said second node, and a control electrode connected to said first node, and a sixth field-effect transistor having a first electrode connected to said reference point, a second electrode connected to said first electrode of said fifth transistor, and control electrode connected to the source of said activation signal; said second switching circuit having a smaller current sink capability than said first switching circuit.

4,051,389

FLIP-FLOP CIRCUIT

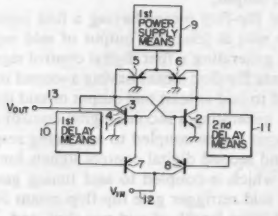
Kenji Kaneko, Kokubunji, and Takahiro Okabe, Tokyo, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 12, 1976, Ser. No. 666,418

Claims priority, application Japan, Mar. 12, 1975, 50-29020; July 23, 1975, 50-89254

Int. Cl.[2] H03K *3/29*

U.S. Cl. 307—291 **7 Claims**



1. A trigger-type flip-flop circuit comprising:

a pair of inversely operated vertical type first and second transistors, said first transistor having dual collectors;

a pair of lateral type third and fourth transistors, each having a polarity opposite to that of said first transistor and operated as a load;

a pair of triggering fifth and sixth transistors, each of which has a polarity opposite to that of said first transistor;

the bases of said first and second transistors being connected to the collector of said second transistor and to one of the dual collectors of said first transistor, respectively;

the collectors of said third and fourth transistors being connected to said one of the dual collectors of said first transistor and to the collector of said second transistor, respectively;

the emitters of said third and fourth transistors being connected to a first power supply means;

the bases of said first and second transistors being connected to the emitters of said fifth and sixth transistors, respectively;

the bases of said fifth and sixth transistors being connected to said one of the dual collectors of said first transistor through first delay means and to the collector of said second transistor through second delay means, respectively;

the collectors of said fifth and sixth transistors being connected to an input terminal for trigger signals;

an output terminal connected to the other collector of the dual collectors of said first transistor;

the emitters of said first and second transistors being electrically connected to a ground terminal; and

the bases of said third and fourth transistors being electrically connected to said ground terminal.

4,051,390

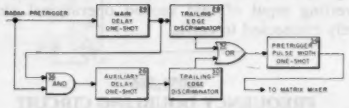
PARALLEL/TIME-SHARED VARIABLE TIME DELAY GENERATOR WITH COMMON TIMING CONTROL AND FAST RECOVERY

Charlie F. Reeves, Del Mar, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 18, 1976, Ser. No. 697,514

Int. Cl.[2] H03K *5/13, 5/159*

U.S. Cl. 307—293 **7 Claims**



1. A system for providing output pulses of a predetermined width after a predetermined delay from the receipt of a pretrigger pulse including a non-retriggerable, main delay one-shot for receiving said pretrigger pulse and having a predetermined timing cycle for providing said predetermined delay, and further comprising:

a first trailing edge discriminator connected to the output of said main delay one-shot;

auxiliary delay means operably coupled to said main delay one-shot for responding to pretrigger pulses occurring during said main delay one-shot timing cycle when said predetermined delay is greater than said predetermined width;

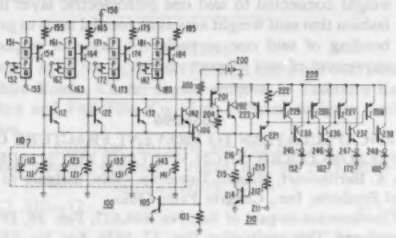
and a retriggerable pulse width one-shot connected to the output of said auxiliary delay means and operably coupled to the output of said first trailing edge discriminator for providing said output pulses of a predetermined width.

4,051,391

CURRENT-OPERATED CIRCUITS AND STRUCTURES

Adel Abdel Aziz Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 24, 1974, Ser. No. 463,606
Int. Cl.[2] H03K *1/12*; H01L *27/02*
U.S. Cl. 307—297 21 Claims



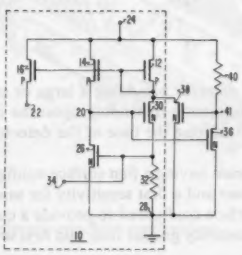
1. A current-mode or gate comprising, in combination:
an output terminal and a common terminal for connection to an output circuit;
a plurality of switches, each having a conduction path and a control electrode for controlling the conductivity of its conduction path, said conduction paths connected in parallel between said output terminal and a third terminal, said control electrodes serving as input terminals;
means direct current conductively coupling said third terminal to said common terminal;
means responsive to an input current of greater than a given value applied to one of said input terminals for causing the path of the switch connected to that input terminal to be conductive; and
regulator means connected for sensing the current flow through said direct current conductive coupling means and responsive to said current exceeding a given fixed value for establishing between each separate one of said input terminals and said common terminal a shunt path for diverting that portion of the signal current applied to its input terminal which would tend to cause the current through said direct current conductive current conductive coupling means to exceed further said given value.

4,051,392

CIRCUIT FOR STARTING CURRENT FLOW IN CURRENT AMPLIFIER CIRCUITS

Bruce David Rosenthal, Highland Park, and Andrew Gordon Francis Dingwall, Somerville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 8, 1976, Ser. No. 675,206
Int. Cl.[2] H03K *17/00*
U.S. Cl. 307—297 10 Claims



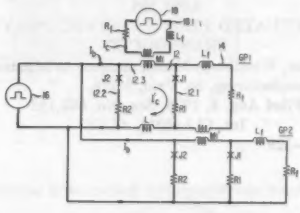
1. In a circuit comprising first and second current amplifiers, each amplifier having input and output terminals, said first current amplifier input and output terminals connected to said second current amplifier output and input terminals respectively, forming a positive feedback loop thereby, wherein said circuit has the undesirable tendency to fail to initiate conduction within said loop upon application of an operating voltage thereto, the improvement comprising a starting circuit for overcoming said undesirable tendency, said improvement comprising:
first means responsive to said application of an operating voltage for initiating a current flow through said first amplifier input terminal, said first means including a first transistor with a control electrode and with a conduction path connected at one end to said first current amplifier input terminal and at its other end to a point at a reference potential; and
second means responsive to the initiation of current flow within said loop for effectively disconnecting said first means from said loop, said second means including an impedance and a second transistor with a control electrode and with a conduction path, said impedance and said second transistor conduction path being serially connected between a terminal for an operating voltage and said point at a reference potential, the point of interconnection between said impedance and said second transistor conduction path being connected to said first transistor control electrode, and said second transistor control electrode being connected to said first amplifier output terminal.

4,051,393

CURRENT SWITCHED JOSEPHSON JUNCTION MEMORY AND LOGIC CIRCUITS

Theodore Alan Fulton, Warren Township, Somerset, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 16, 1976, Ser. No. 751,127
Int. Cl.[2] H03K *19/95*
U.S. Cl. 307—306 17 Claims



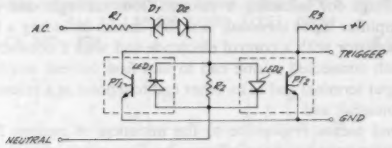
1. A superconductive circuit comprising:
a loop circuit including a resistor, and first and second branches in parallel with one another,
said first and second branches including first and second Josephson junction devices, respectively;
a fan-out line connected in parallel with said branches,
bias means for applying a pulsed bias current to said loop circuit so that said devices are biased below their critical current I_J for switching said devices from their zero voltage state to their finite voltage state, and
control means for generating a pulsed control current in said loop circuit so that in said first branch the bias and control currents add and exceed I_J causing said first device to switch to its finite voltage state, which then causes substantially the entire bias current to flow through said second branch exceeding I_J and causing said second device to switch to its finite voltage state, which in turn causes substantially the entire bias current to divert to said fan-out line.

4,051,394

ZERO CROSSING AC RELAY CONTROL CIRCUIT

Jansey D. Tieden, Puyallup, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 15, 1976, Ser. No. 666,642
Int. Cl.² H03K *17/00*
U.S. Cl. 307—310 **9 Claims**



1. A zero crossing AC relay control circuit for controlling the closure of the contacts of a relay having a known, predetermined time interval between the application of a trigger voltage to said relay and the actual closing of said relay contacts, said zero crossing AC relay control circuit comprising:

voltage breakdown means for controlling current flow through a circuit such the AC current only flows through said circuit if the instantaneous value of the AC voltage applied to said circuit is above a predetermined level, said voltage breakdown means further controlling said current flows such that current flow terminates a predetermined period of time before the AC voltage crosses zero, said predetermined period of time remaining generally constant from one AC cycle to the next and being substantially equal to the known predetermined time interval between the application of a trigger voltage to said relay and the closure of the switch contacts of said relay;

sensing means connected to said voltage breakdown means for sensing the absence of current flow controlled by said voltage breakdown means; and,

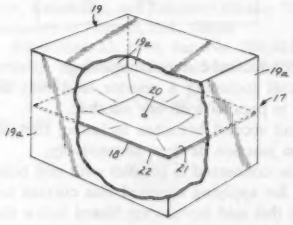
trigger signal generating means connected to said sensing means for producing a relay-operating trigger signal when said sensing means senses the absence of the current flow controlled by said voltage breakdown means.

4,051,395

WEIGHT ACTUATED PIEZOELECTRIC POLYMERIC TRANSDUCER

Allen L. Taylor, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing, St. Paul, Minn.

Filed Aug. 8, 1975, Ser. No. 603,155
Int. Cl.² H01L *41/04*
U.S. Cl. 310—329 **1 Claim**



1. A piezoelectric polymeric transducer for converting mechanical energy to electrical energy comprising:

a support means;

at least one layer of compliant, poled, polymeric, piezoelectric material attached by at least two opposite ends to said support means, said piezoelectric material being such as to produce electrostatic charges of opposite polarity on its opposite major surfaces when subjected to bending;

first conductive electrodes carried on only the outer portions of at least two opposite ends of each planar surface of said one piezoelectric layer adjacent to said support means;

second conductive electrodes carried on the center portions of the planar surfaces of said one piezoelectric layer, said first and second conductive electrodes being electrically connected to each other to adjust the electrical energy output of said transducer; and

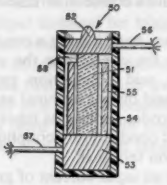
a weight connected to said one piezoelectric layer in such fashion that said weight acts as an inertial mass to produce bending of said one piezoelectric layer in response to movement of said support means.

4,051,396

ENCAPSULATION TO PREVENT FRACTURE OF PIEZOELECTRIC HIGH VOLTAGE MECHANISM

Don A. Berlincourt, Russell Township, Ohio, assignor to Channel Products, Inc., Chagrin Falls, Ohio

Continuation-in-part of Ser. No. 446,627, Feb. 28, 1974, abandoned. This application Dec. 17, 1974, Ser. No. 533,646
Int. Cl.² H01L *41/08*
U.S. Cl. 310—340 **10 Claims**



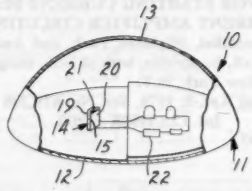
1. A high voltage piezoelectric mechanism with piezoelectric element means essentially coated with viscid insulating material.

4,051,397

TWO SENSITIVITY LEVEL KINETIC SENSOR

Allen L. Taylor, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 8, 1975, Ser. No. 603,156
Int. Cl.² H01L *41/04*
U.S. Cl. 310—351 **4 Claims**



1. A motion detector providing a large or small scale sensitivity sensing operation depending upon the configuration of the surface constituting the base of the detector, said detector comprising:

a housing means having a first surface configured to provide a planar base and a first sensitivity for said detector and a second surface configured to provide a curved base and a second sensitivity greater than said first sensitivity for said detector.

sensing means disposed within and operatively associated with said housing means, said sensing means including piezoelectric means responsive to movement of said detector to provide an electrical current having a first magnitude when said detector is supported on said planar base

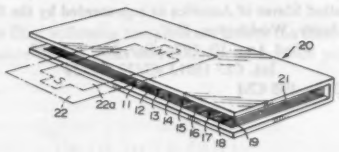
and a second magnitude larger than said first magnitude when said detector is supported on said curved base, and electrical circuit means disposed within said housing means in electrical association with said sensing means to receive said electrical current provided by said sensing means, said electrical circuit means including signal means energizable to provide a detectable signal in response to movement of said detector.

4,051,398

COIL MEANS FOR DRIVING A LINEAR MOTOR

Toshihiro Kondo, Chofu, Japan, assignor to Toshihiro Kondo, Tokyo and Fuji Film Co., Ltd., Minami-ashigara, both of, Japan

Filed Apr. 15, 1976, Ser. No. 677,163
Claims priority, application Japan, Apr. 17, 1975, 50-46704
Int. Cl.² H02K *33/00*
U.S. Cl. 310—12 **10 Claims**



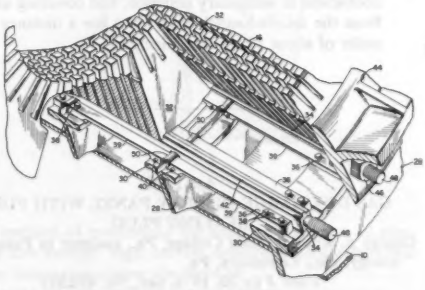
1. A coil means for driving a movable member in a linear motor system comprising a series of electromagnetic coils arranged in a line along a path in which the movable member travels, and energized successively from one at one end thereof to the one at the other end in the direction of movement of the movable member, said series of electromagnetic coils being in the form of thin coils and arranged in a line partially overlapped with each other and fixed together to form an elongated one-piece coil group, and said coil group having a cross-section of a shape of "U" to guide the movable member therein.

4,051,399

DYNAMOELECTRIC MACHINE INCLUDING GAS BAFFLES

Casmer P. Stanwick, and Lawrence E. Jordan, both of Amsterdam, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed June 17, 1976, Ser. No. 696,908
Int. Cl.² H02K *5/24*
U.S. Cl. 310—51 **7 Claims**



1. A dynamoelectric machine comprising:

a. a frame,

b. a plurality of circumferentially spaced spring bars adjacent said frame extending longitudinally thereof and secured to said frame at spaced points,

c. a plurality of circumferentially spaced keybars adjacent to but spaced from said frame and extending longitudinally thereof, each of said keybars being supported by a corresponding spring bar but spaced from said spring bar along a substantial portion of its length,

d. a stator core mounted on said keybars but spaced from said spring bars to minimize transmission of vibration from said core to said frame, said core comprising a plurality of core sections, each core section being mounted on two keybars, said core having alternate first passages for inflow of cooling gas and second passages for outflow of cooling gas, and

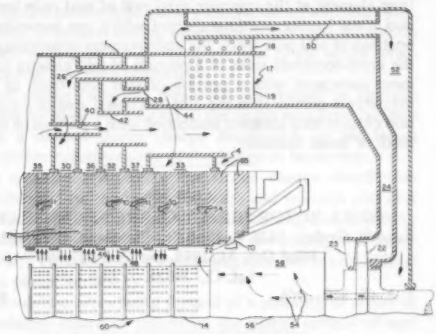
e. a plurality of baffles, one baffle being positioned on each of said spring bars in each region between said first and second passages, each baffle including a portion disposed between said spring bar and said core and resiliently engaging said core to block flow of cooling gas between said core and said spring bar while minimizing transmission of vibration from said core to said frame.

4,051,400

END GAS GAP BAFFLE STRUCTURE FOR REVERSE FLOW COOLED DYNAMOELECTRIC MACHINE

Anthony F. Armor, and David H. Winne, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 5, 1976, Ser. No. 655,392
Int. Cl.² H02K *9/00*
U.S. Cl. 310—58 **13 Claims**



1. A reverse flow cooled dynamoelectric machine comprising:

a gas-tight casing containing cooling gas;

a stator disposed within said casing and including a core of stacked laminations having axially spaced radially extending cooling passages disposed therein, the end regions of said core comprising radially foreshortened laminations with inboard ends progressively farther removed from the axis thereof providing an array of progressively stepped laminations;

a rotor disposed within said stator and spaced therefrom by a gas gap;

fan means disposed in said casing for the reverse flow circulation of the cooling gas; and,

a baffle disposed in said gap and spaced from said stepped laminations for directing a flow of cooling gas flowing axially outwardly from said gas gap to said end regions across said stepped laminations and for increasing the velocity of flow of cooling gas across said stepped laminations and said baffle includes an annular member having outer face spaced from and generally parralell to the inboard edtes of said stepped laminations.

4,051,401

MAGNETIC LOOPS CLOSURE ELEMENTS FOR ELECTRIC MOTOR

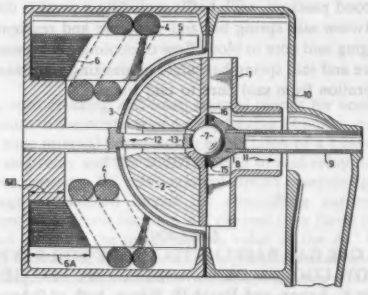
William George Hayward, 76 Woodcrest Walk, Reigate, Surrey, England

Filed June 1, 1976, Ser. No. 691,288

Claims priority, application United Kingdom, June 2, 1975, 23773/75

Int. Cl.² H02K *1/06*

U.S. Cl. 310—216 **4 Claims**



1. An electric motor including a stator having a plurality of radially extending magnetically soft iron elements forming pole teeth having portions of greater and lesser diameters, a rotor at one axial end of said pole teeth adapted to conduct magnetic flux between said pole teeth, and a magnetic closure loop element at the opposite axial end of said pole teeth than said rotor having portions thereof which are associated with portions of said pole teeth; the improvement comprising in that the cross-sectional areas of a portion of said closure loop element associated with a portion of said pole teeth of greater diameter is greater than the cross-sectional area of a portion of said closure loop element associated with a portion of said pole teeth of lesser diameter.

4,051,402

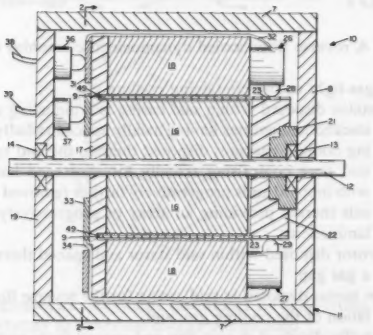
SHELL ROTOR DIRECT CURRENT GENERATOR

John R. Gruber, 1421 E. 32nd St., Cleveland, Ohio 44114

Filed Oct. 31, 1975, Ser. No. 627,664

Int. Cl.² H02K *1/22*

U.S. Cl. 310—266 **8 Claims**



1. A current generator comprising in combination:

a. a pair of magnetic members each comprising an annularly arranged series of alternate magnetic poles, said members being spaced axially from each other to define therebetween an annular axial air gap;

b. a cylindrical rotor mounted for continuous rotation within said axial air gap and formed of longitudinally aligned non-ferrous conducting segments, said segments being separated by an air gap a substantial portion of the longitudinal length of said conducting segments, said conducting segments further being in electrical communication at one end thereof and having commutator means at the opposite end thereof; and

c. means for maintaining a relative velocity between said cylindrical rotor and said magnetic members.

4,051,403

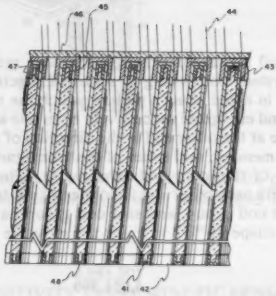
CHANNEL PLATE MULTIPLIER HAVING HIGHER SECONDARY EMISSION COEFFICIENT NEAR INPUT

Robert M. Feingold, Annandale; Carl W. Hoover, Jr., Woodbridge, and John Rennie, Alexandria, all of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 10, 1976, Ser. No. 713,165

Int. Cl.² H01J *43/22, 43/24*

U.S. Cl. 313—105 CM **4 Claims**



1. In a microchannel plate electron multiplier comprising a plurality of channels, each of said channels having a diameter on the order of 10–15 microns and a length on the order of about 20 mils, the channel wall comprising a conductive glass having a relatively low coefficient of secondary emission, the improvement comprising:

a first layer of booster material having a relatively high coefficient of secondary emission, and covering said wall from the microchannel plate input for a distance on the order of about 10 channel diameters.

4,051,404

GAS DISCHARGE DISPLAY PANEL WITH FUSED SEALING PLUG

George A. Kupsky, State College, Pa., assignor to Panel Technology, Inc., Lewistown, Pa.

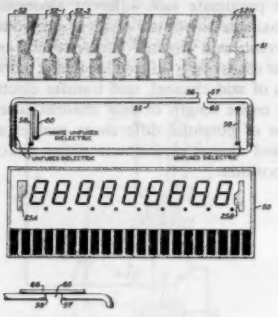
Filed July 30, 1974, Ser. No. 492,991

Int. Cl.² H01J *61/36*

U.S. Cl. 313—220 **6 Claims**

1. A gas discharge information display panel having a pair of flat glass substrate plates carrying electrode segments and dielectric members thereon, seal means rendering said display panel tubulationless comprising a glass seal member joining said flat glass substrate plates in spaced apart relation, said glass seal member having a configuration defining the perimeter of a gas chamber in said panel, said glass seal member having at

least a pair of spaced apart ends defining a vacuumization and gas fill port, a fill gas in said chamber, and a glass plug member



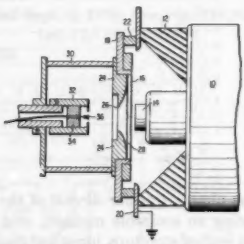
having a fiber softening temperature below the fiber softening temperature of said glass seal member filling said port.

4,051,405

METHOD FOR CONTROLLING LOW-ENERGY HIGH CURRENT DENSITY ELECTRON BEAMS

John N. Lee, Silver Spring, and Robert B. Oswald, Jr., Bethesda, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 10, 1975, Ser. No. 612,053
Int. Cl.[2] H01J *1/00*; H05H *1/00*
U.S. Cl. 313—361 **6 Claims**



1. A method of controlling the angle of incidence of electrons in low energy, high current density, pulsed relativistic electron beams comprising the steps of:

producing a freely drifting electron beam;

placing a grounded mesh electrode in the path of said beam;

said step of producing further includes the steps of accelerating an electron beam from a cathode electrode to an anode electrode through a significant potential difference; and,

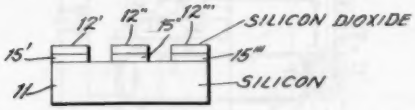
said step of placing includes the step of positioning said grounded mesh electrode between said anode and a target at a point where internal forces within the drifting beam have become apparent.

4,051,406

ELECTRONIC STORAGE TUBE TARGET HAVING A RADIATION INSENSITIVE LAYER

Albert S. Waxman, Santa Clara, Calif., assignor to Princeton Electronic Products, Inc., North Brunswick, N.J.

Continuation of Ser. No. 430,257, Jan. 2, 1974, abandoned. This application Sept. 24, 1975, Ser. No. 616,125
The portion of the term of this patent subsequent to Feb. 24, 1993, has been disclaimed.
Int. Cl.[2] H01J *29/41*, *31/08*
U.S. Cl. 313—391 **8 Claims**



1. An electronic storage tube for storing images by means of a modulated electron beam, said tube having a target structure including first means substantially unaffected by ionizing radiation which is present during operation of the tube for significantly increasing the image retention time of the target structure wherein said tube comprises:

second means including means for generating an electron beam for applying a signal to the target structure to establish a desired stored charge distribution on the target structure representative of the image to be stored;

third means for detecting the stored charge distribution established on the target structure and wherein said first means comprises a pattern of conducting and insulating areas, said conducting areas being electrically connected to each other to form a conducting member having at least one planar surface;

said insulating areas being formed of a plurality of layers of insulating materials placed on the planar surface of said conducting member;

each of said layers having first and second planar surfaces, the first planar surface of one of said layers being in contact with the planar surface of the conducting member and the second planar surface of said one of said layers being in contact with the first planar surface of another one of said layers;

the second planar surface of the insulating layer furthest removed from said conducting member constituting the surface for storing the charge pattern;

the first planar surface of said last mentioned insulating layer being in contact with the second surface of the insulating layer adjacent thereto;

all of said layers being arranges to overlie portions of said conducting member planar surface while the remaining portions of said conducting member planar surface are exposed to said electron beam;

at least one of said insulating layers being formed of an insulating material whose conductivity is unaffected by the presence of ionizing radiations to prevent the transfer of charge stored on the stored charge surface to significantly increase image retention time of the charge pattern being stored, even after repeated readout.

4,051,407
ARRANGEMENT INCLUDING A GAS AND/OR VAPOR DISCHARGE LAMP

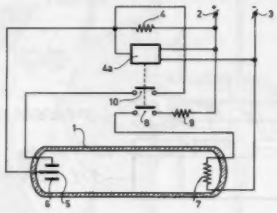
Jan Evert van der Werf; Jean Johan Heuvelmans, and Hendricus Franciscus Johannes Jacobus van Tongeren, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 19, 1976, Ser. No. 668,586

Claims priority, application Netherlands, Apr. 1, 1975, 7503826

Int. Cl.² H05B *41/14, 41/36*

U.S. Cl. 315—106 **10 Claims**



1. Apparatus for operating an electric discharge lamp substantially free of any ballast device comprising, a pair of input terminals for applying electric power to the apparatus, a substantially impedance free electric coupling means connecting the discharge lamp across the input terminals, said discharge lamp having first and second main electrode systems defining a discharge path through the lamp, one of said electrode systems comprising a preheatable electrode operable as a cathode, an auxiliary circuit responsive to the lamp current flow between the first and second main electrode systems and including means for altering the electrode voltge drop in the vicinity of at least one of said main electrode systems, said auxiliary circuit, in the operating condition of the discharge lamp, being responsive to a change in the effective value of the current flowing between the lamp first and second main electrode systems so as to change said electrode voltage drop in a manner such as to oppose said change in current between said first and second main electrode systems, said change in the electrode voltage drop being effected at least partly by changing the magnitude of the heating current supplied to said preheatable electrode.

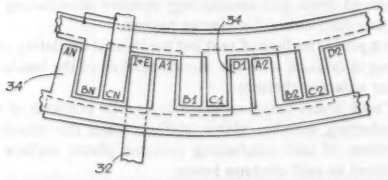
4,051,408
CIRCULAR PLASMA CHARGE DISPLAY DEVICE

Herman Albertine, Jr., Geneva; Donald G. Craycraft, and William E. Coleman, both of St. Charles, all of Ill., assignors to NCR Corporation, Dayton, Ohio

Filed Jan. 13, 1976, Ser. No. 648,766

Int. Cl.² H05B *41/14, 41/44*

U.S. Cl. 315—169 R **11 Claims**



1. In a plasma charge transfer device of the type having a channel containing an ionizable medium, said channel being defined within a walled structure, at least one wall thereof being transparent, input and transfer electrodes positioned on inside wall surfaces, said transfer electrodes being arranged in alternating sequence and offset from one another on opposite inside wall surfaces, and means for applying a potential difference between adjacent electrodes whereby the medium will emit light proximate said adjacent electrodes and leave a charge proximate one of the adjacent electrodes, the improvement wherein: said channel comprises an endless length, a single input electrode is utilized located at a first position along the length of said channel, said transfer electrodes extending along the entire length of said channel whereby sequential application of potential differences enables shifting of light emission and charge positions in either direction relative to said first position.

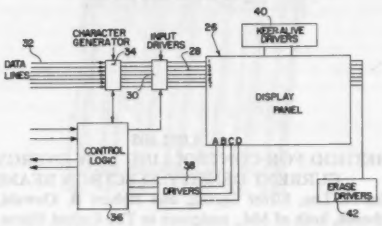
4,051,409
LOAD AND HOLD SYSTEM FOR PLASMA CHARGE TRANSFER DEVICES

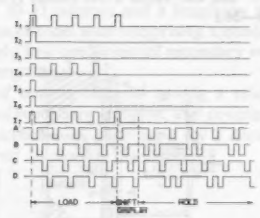
Donald Gregory Craycraft, St. Charles, Ill., assignor to NCR Corporation, Dayton, Ohio

Filed Jan. 13, 1976, Ser. No. 648,767

Int. Cl.² H05B *41/30, 41/44*

U.S. Cl. 315—169 TV **13 Claims**



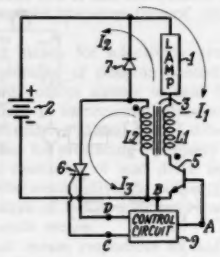


1. In a plasma charge transfer device of the type having a channel containing an ionizable medium, said channel being defined within a walled structure, input and transfer electrodes positioned on the inside wall surfaces, said transfer electrodes being arranged in alternating sequence and opposite from one another on opposite inside wall surfaces, and means for applying a potential difference between adjacent electrodes whereby the medium will emit light proximate said adjacent electrodes and leave a charge proximate one of said adjacent electrodes, the application of succeeding potential differences between adjacent transfer electrodes along the length of the device operating to shift said charge away from the position of the input electrode, the improvement comprising means for holding a charge in that location of the device to which the charge has been shifted, said holding means including means for circulating the charge between the electrodes of a set of at least four sequentially positioned transfer electrodes.

4,051,410
DISCHARGE LAMP OPERATING CIRCUIT

David W. Knoble, East Flat Rock, N.C., assignor to General Electric Company, New York, N.Y.

Filed Sept. 2, 1976, Ser. No. 719,763
Int. Cl.² H05B 41/34
U.S. Cl. 315—205 17 Claims

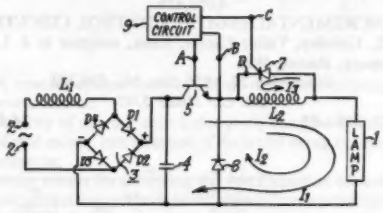


1. A lamp operating circuit comprising, in combination, a direct current power source, a first branch including first controlled switch means across said power source, a second branch including unidirectional conducting means across said power source, a transformer having a primary winding in said first branch in series with said first controlled switch means and a secondary winding in said branch in series with said unidirectional conducting means, means for connecting a gaseous discharge lamp to said power source in series with at least one of said branches, second controlled switch means coupled to said secondary winding for substantially stopping current flow to said unidirectional conducting means and for storing magnetic energy in said transformer while said second controlled switch means is on, and control means coupled to said first and second controlled switch means for repetitively and sequentially operating the same at predetermined intervals, whereby DC pulses may be applied to the gaseous discharge lamp for operation thereof.

4,051,411
DISCHARGE LAMP OPERATING CIRCUIT

David W. Knoble, East Flat Rock, and Don Morais, Hendersonville, both of N.C., assignors to General Electric Company, New York, N.Y.

Filed Sept. 2, 1976, Ser. No. 719,764
Int. Cl.² H05B 41/34
U.S. Cl. 315—205 16 Claims

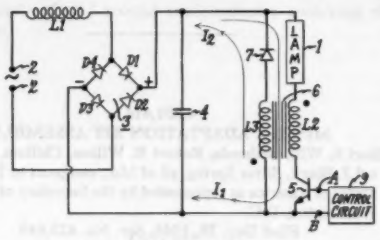


1. A lamp operating circuit comprising. in combination, a direct current power source, first controlled switch means and inductance means connected in series across said power source, means for serially connecting a gaseous discharge lamp to said first controlled switch means and said inductance means, unidirectional conducting means connected across said series connected inductance means and said lamp connecting means, second controlled switch means coupled to said inductance means for stopping current flow to the gaseous discharge lamp and for storing magnetic energy in said inductance means while said controlled switch means is on, and control means coupled to said first and second controlled switch means for repetitively and sequentially operating the same at predetermined intervals, whereby DC pulses may be applied to the gaseous discharge lamp for operation thereof.

4,051,412
DISCHARGE LAMP OPERATING CIRCUIT

David W. Knoble, and Daniel V. Owen, both of East Flat Rock, N.C., assignors to General Electric Company, New York, N.Y.

Filed Sept. 2, 1976, Ser. No. 719,765
Int. Cl.² H05B 41/34
U.S. Cl. 315—205 16 Claims

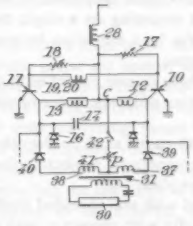


1. A lamp operating circuit comprising, in combination, a direct current power source, controlled switch means across said power source, a transformer having a primary winding and a secondary winding, said primary winding in series with said controlled switch means, unidirectional conducting means in series with said secondary winding across said power source, means for connecting a gaseous discharge lamp in series with said controlled switch means and said primary winding, and control means coupled to said controlled switch means for repetitively operating the same at predetermined intervals, whereby DC pulses may be applied to the gaseous discharge lamp for operation thereof.

4,051,413
TRANSISTORIZED STATIC INVERTERS

Henry J. L. Abadie, "Le Chateau", 65140 Monfaucon, France

Filed May 26, 1976, Ser. No. 690,355
Int. Cl.² H02M 7/48; H05B 41/29
U.S. Cl. 315—219 8 Claims



1. A static inverter for converting direct voltage into alternating voltage, comprising:

a. a first and a second switching transistors each having emitter, collector and base,

b. a first resistor and a second resistor respectively connecting the bases of said first and second transistors to a junction point and operating as current generator for said transistors,

c. a source of DC voltage connected to said junction point,

d. inductance means inductively coupling said bases,

e. first and second coils inductively coupled to said inductance means and respectively connecting the collectors of said transistors to said junction,

f. capacitor means connecting said collectors, said capacitor means, coils and inductance means constituting a frequency pilot circuit for said transistors,

g. first and second switching rectifier means connecting the collectors of said transistors to ground for uncoupling said collectors,

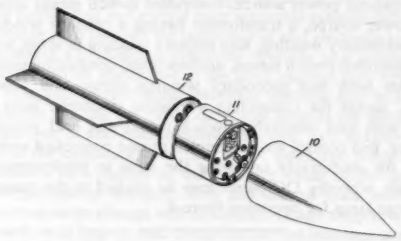
h. and at least one output transformer, each said transformer having a primary connected across said collectors and a secondary whose ends constitute terminals for connection of an output load.

4,051,414

MISSILE ADAPTATION KIT ASSEMBLY

Albert S. Will, Bethesda; Robert R. Wilson, Chillum, and Samuel J. Black, Silver Spring, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 28, 1964, Ser. No. 423,643
Int. Cl.² H02B 1/04
U.S. Cl. 361—415 **7 Claims**



1. A cylindrical mechanical package for electrical equipment, comprising:

a plurality of circular supporting plates having a prescribed number of aligned holes therein;

spacer means for supporting said plates in spaced relation;

electrical components supported between said plates either by a direct mounting on a single one of said supporting plates and/or by a mounting between two adjacent supporting plates;

a projecting boss on one end of each of said electrical components fitting slideably in one of said holes in one of said plates; and

a projecting threaded shaft on the other end of each of said electrical components projecting through an aligned hole in the other plate; and

a nut engaged with said threaded shaft to secure each component rigidly with respect to said other plate;

whereby displacements of said plates away from and toward each other due to shock loadings do not impose any strains on the electrical components;

each of said electrical components having a terminal board thereon, said components being mounted so as to dispose said terminal boards adjacent the cylindrical periphery of the package; and

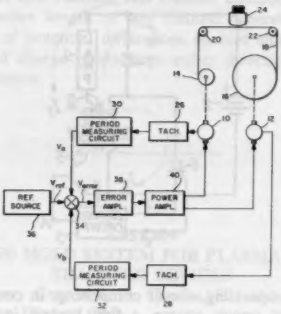
electrical interconnecting means coupling said terminal boards, said interconnecting means consisting of flat tape cables extending around the cylindrical periphery of said package.

4,051,415

WEB SPEED CONTROL SYSTEM

Peter G. Martin, Arlington, Mass., assignor to Braemar Computer Devices, Inc., Burnsville, Minn.

Filed Mar. 5, 1975, Ser. No. 555,358
Int. Cl.² H02P 5/50
U.S. Cl. 318—7 **19 Claims**



1. For use in a reel driven web transport system including a supply reel, a takeup reel, a drive motor coupled to said takeup reel, a control circuit for maintaining substantially constant linear web speed of a web moving between said reels, said control circuit comprising:

first means for determining a rotational characteristic of said supply reel and providing a first signal representative thereof;

second means for determining a rotational characteristic of said takeup reel and providing a second signal representative thereof;

first and second non-linear processing means respectively operative in response to said first and second signals to provide respective non-linear signal representations of said rotational characteristics;

means for summing said non-linear signal representations;

means for providing an error signal from said summed signal; and

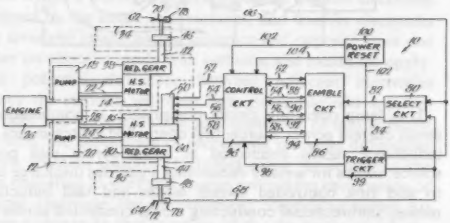
means operative in response to said error signal to provide a control signal to said drive motor to govern its speed of rotation and produce substantially constant linear web speed.

4,051,416

INCREMENTAL DIGITAL CONTROL CIRCUIT

Gary L. Golobay, Valley Center, Kans., assignor to J. I. Case Company, Racine, Wis.

Filed May 27, 1976, Ser. No. 690,383
Int. Cl.² H02P 5/46
U.S. Cl. 318—85 **14 Claims**



1. In an implement having a plurality of drive motor means, a plurality of driven members coupled to and driven by said

drive motor means, and actuator means selectively operating said drive motor means to drive said driven members;

a digital control system enabled in response to operation of said actuator means to operate said drive motor means in synchronism for producing selected control signals to effect incremental adjustment of the operation of at least a first one of said drive motor means relative to the operation of a second one of said drive motor means to achieve said synchronized operation thereof, said control system comprising:

control circuit means for selectively producing different ones of a plurality of possible control signals and for applying said control signals to said first drive motor means to effect an incremental adjustment of the operations thereof relative to said second drive motor means;

transducer means for producing a plurality of pulse trains in response to operation of said drive motor means, the relationship between individual pulses of said pulse trains being indicative of the operational relationship between said drive motor means;

selection circuit means responsive to said pulse trains for producing a first selection signal in response to a first relationship between individual pulses of said pulse trains;

enabling circuit means for producing an enabling signal in response to said selection signal to enable said control circuit for production of a selected control signal; and

trigger circuit means responsive to said pulse trains for producing a trigger signal;

said enabled control circuit producing said selected control signal in response to said trigger signal.

4,051,417

CONTROL SYSTEM FOR A BRUSHLESS MOTOR

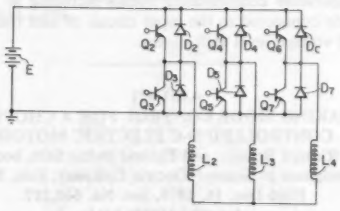
Masaaki Fujinawa, Hachioji; Kiyoo Takeyasu, Tokorozawa; Kenichi Iizuka, Shimotsuga; Motokazu Uchida, Setagaya, and Hideo Uzuhashi, Shimotsuga, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 4, 1975, Ser. No. 610,289

Claims priority, application Japan, Sept. 4, 1974, 49-100903

Int. Cl.[2] H02K *29/00*

U.S. Cl. 318—138 **6 Claims**



1. A control system for a brushless motor comprising:

a power source;

a plurality of driving coils inductively coupled with a rotor of said motor, one terminal of each coil being connected in common;

detector means for detecting the rotor position of said rotor and generating rotor position signals corresponding to the position of said rotor;

an oscillator for generating a chopping signal;

a logic circuit, coupled to said detector means and said oscillator, for chopping a portion of said rotor position signals in response to the chopping signal from said oscillator;

a plurality of first semiconductor switching elements each having a first terminal connected to another terminal of each of said coils, respectively, a second terminal connected to one terminal of said power source, and a control terminal;

a plurality of second semiconductor switching elements each having a first terminal connected to another terminal of said power source, a second terminal connected to the first terminal of a respective one of said first semiconductor switching elements, and a control terminal;

a plurality of rectifying elements respectively connected across the first and second terminals of each of said first and second semiconductor switching elements, so as to be rendered conductive in a direction opposite to the conduction direction of said first and second semiconductor switching elements;

first means for applying the portion of the rotor position signals chopped by said logic circuit to the control terminals of said first semiconductor switching elements; and

second means for directly applying a portion of the rotor position signals from said detector means to the control terminals of said second semiconductor switching elements.

4,051,418

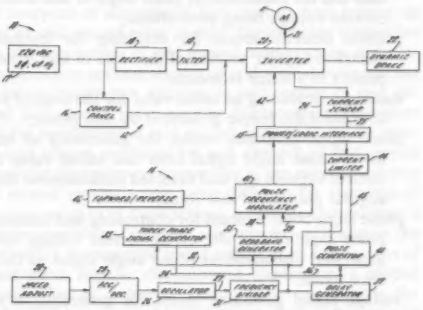
THREE PHASE A.C. MOTOR DRIVE SYSTEM

Gerald N. O'Berto, 850 Lorraine Road, Wheaton, Ill. 60187, and Gisuke Murakami, 496 Imaiminami-cho, Nakahara, Kawasaki, Japan (211)

Filed Nov. 3, 1975, Ser. No. 627,980

Int. Cl.[2] H02P *5/40*

U.S. Cl. 318—227 **2 Claims**



1. A system for generating a three phase variable frequency signal for driving a three phase a.c. motor, said system comprising the combination of a d.c. voltage source having positive and negative voltage levels, an inverter having a plurality of controllable solid state switching means for selectively applying said positive and negative voltage levels alternately to each of three output lines to generate a three phase a.c. output, means for controlling the rise times of the positive and negative currents flowing to the inverter, current sensing means for generating a control signal in response to an increase in the magnitude of the inverter current flow through said inverter above a predetermined level, and current limiting means responsive to said control signal for limiting the inverter current flow to said predetermined level, said current sensing means comprising a resistor between said d.c. voltage source and the inverter, the voltage drop across said resistor being proportional to the current therethrough, an amplifier for amplifying the magnitude of the voltage drop across said resistor, and a silicon bidirectional switch which generates a control signal when said amplified resistor voltage drop exceeds a predetermined level.

4,051,419
CONTROL SYSTEM OF AN ALTERNATING-CURRENT MOTOR

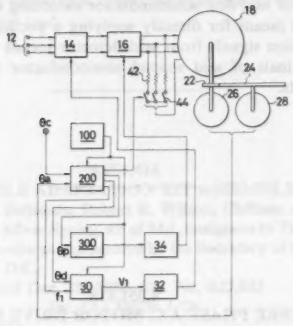
Shuichi Takahashi, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 4, 1976, Ser. No. 693,262

Claims priority, application Japan, June 9, 1975, 50-068500; June 19, 1975, 50-073685; July 16, 1975, 50-086168; Nov. 17, 1975, 50-137291

Int. Cl.² H02P *5/40*

U.S. Cl. 318—227 **23 Claims**



1. A control system of a polyphase alternating-current motor comprising:

a polyphase alternating-current motor;

power supply means for generating a polyphase alternating-current voltage to be supplied to said motor, the amplitude and the instantaneous phase angle of said alternating-current voltage being controllable;

position detector means for detecting the instantaneous electrical angular position of the rotor of said motor with respect to a stator reference;

means for producing an initial value for the control variable to control the torque generated by said motor;

phase signal generator means for generating an instantaneous phase angle signal from said initial value for the control variable and said detected instantaneous electrical angular position of said rotor;

phase angle control means for controlling said instantaneous phase angle of said alternating-current voltage with said generated instantaneous phase angle signal as the reference signal;

voltage signal generator means for generating a voltage signal in accordance with a predetermined voltage control law; and

voltage control means for controlling said amplitude of said alternating-current voltage with said generated voltage signal as the reference signal.

4,051,420
HALL MOTOR CONTROL SYSTEM

Kinji Tanikoshi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha and Canon Seiki Kabushiki Kaisha, both of Tokyo, Japan

Filed Mar. 5, 1976, Ser. No. 664,385

Claims priority, application Japan, Mar. 10, 1975, 50-28821; Apr. 11, 1975, 50-43943

Int. Cl.² H02K *29/00*

U.S. Cl. 318—254 **12 Claims**

1. A DC motor having a control system therefor comprising, in combination:

a. a rotor having thereon magnetic poles of the opposite polarities;

b. a stator having flux-producing windings positioned in torque-producing relationship with said rotor, each of said windings producing an induced voltage upon rotation of said rotor;

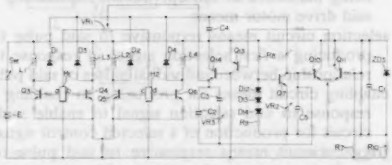
c. detecting means for detecting and synthesizing the induced voltages in said windings;

d. voltage level shift means for level-shifting the output voltage of said detecting means, said level shift means having a transistor circuit connected to said detecting means;

e. constant voltage means connected to one electrode of a power source for producing always a constant potential with respect to the potential of said electrode;

f. reference rotational speed information input means connected across said constant voltage means for producing a constant voltage corresponding to the reference rotational speed of said motor;

g. comparing means comprising a differential amplifier circuit having two input terminals, one of said input terminals being connected to said voltage level shift means and the other input terminal being connected to said reference rotational speed information input means so as to provide a signal representing the difference between said two inputs;



h. Hall generators positioned in flux-producing relationship with said magnetic poles for producing a Hall voltage corresponding to the output voltage of said comparing means;

i. driving control means connected to the output of said Hall generators and said stator windings to apply an exciting current to said windings in response to the output voltage of said Hall generators; and

j. temperature compensating means including at least one diode connected to the input circuit of said transistor of said voltage level shift means.

4,051,421
BRAKING MODE CONTROL FOR A CHOPPER CONTROLLED D-C ELECTRIC MOTOR

Thomas Richard Brinner, and Thomas Deltor Stitt, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Dec. 16, 1975, Ser. No. 641,217

Int. Cl.² H02P *3/14*

U.S. Cl. 318—367 **14 Claims**

FIG.1A
FIG.1B

1. A control system for effecting smooth resistor staging during electrical braking of a chopper controlled d-c electric motor comprising:

a. a plurality of resistor stages serially connected in a motor current path, each of said stages including a resistor and power switching means having normally open main contacts connected in parallel circuit arrangement with said resistor;

b. a chopper circuit including dynamic braking means connected in said motor current path for providing a series

impedance the magnitude of which can be varied between minimum and maximum limits;

c. sensor means for sensing motor current in said path and for providing a feedback signal proportional thereto;

d. means for supplying a reference signal proportional to a desired motor current;

e. summing means for summing said reference signal and said feedback signal and for providing an error signal proportional to any difference in magnitude therebetween;

f. control means connected to receive said error signal and responsive thereto to vary the impedance of said chopper circuit in a manner tending to reduce said error signal to a minimum value, said control means including means for selectively actuating the power switching means in said resistor stages when the impedance of said chopper circuit reaches said minimum limits, each power switching means being operative when actuated to effect closure of its respective main contacts to thereby short-circuit the corresponding resistor;

g. detector means coupled to the main contacts of each power switching means for sensing operation thereof, said detector means providing an output signal during operation of said main contacts; and

h. means responsive to said output signal for changing said error signal only during closing operation of said main contacts to a magnitude which causes said control means to adjust said chopper circuit impedance to a value intermediate said minimum and maximum limits.

4,051,422

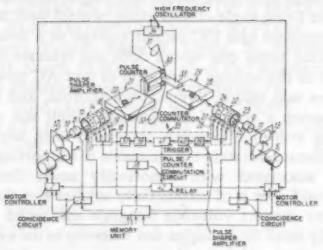
PROGRAMMING APPARATUS FOR ELECTROEROSION CUTTING MACHINE

Konstantin Nikitich Lavrentiev, ulitsa Dzerzhinskogo, 23, kv. 8; Natalya Isaakievna Borisova, Piskarevsky prospekt, 40, kv. 82; Jury Ivanovich Vasiliev, Menshikovsky prospekt, 19, kv. 56; Jury Nikolaevich Rodionov, Tallinskoe shosse, 54, kv. 61; Vadim Konstantinovich Strashinsky, ulitsa B.Zelenina, 26, kv. 24; Vladimir Fedorovich Ioffe, Kirovsky prospekt, 69/71, kv. 5, all of Leningrad, U.S.S.R., and Iosif Yakovlevich Vyatskin, decreased, late of Leningrad, U.S.S.R., by Itta Moiseevna Vyatskina, administrator

Filed Oct. 16, 1975, Ser. No. 623,072

Int. Cl.[2] G05B *19/24*

U.S. Cl. 318—570 **1 Claim**

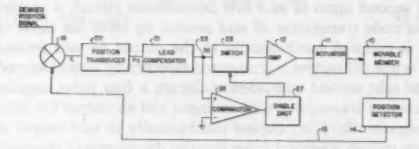


1. A programming device for an electroerosion cutting machine with first and second jig tables displaced by first and second motion screws comprising: an input memory unit with three inputs and five outputs, said first input serving to receive the programme carrier; a first motor controller with four inputs and one output, said first input being connected to said first output of said input memory unit; a second motor controller with four inputs and one output, said first input being connected to said second output of said memory unit; a first coincidence circuit with a first and a second inputs and one output, said first input connected to said third output of said input memory unit and said output being connected to said second input of said first motor controller and to said second input of said input memory unit; a second coincidence circuit with a first and a second inputs and an output, said first input being connected to said fourth output of said input memory unit and said output being connected to said second input of said second motor controller and to said third input of said input memory unit; a first motor the input of which is connected electrically to said output of said first motor controller; a second motor the input of which is connected electrically to said output of said second motor controller; a first position code transmitter of said first jig table input of which is coupled mechanically to the output of said motor while the output is connected electrically to said second input of said first coincidence circuit; a second position code transmitter of said second jig table the input of which is coupled mechanically to the output of said second motor while the output is connected electrically to said second input of said second coincidence circuit; a first pulse angular displacement transmitter with an input and an output for electrical signals which is coupled mechanically to said output of said first motor; a second pulse angular displacement transmitter with an input and an output for electrical signals which is coupled mechanically to said output of said second motor; said output of said first motor rotating said first position code transmitter of the first jig table and the first pulse angular displacement transmitter is coupled mechanically to said first motion screw which moves said first jig table; said output of said second motor rotating said second position code transmitter of the second jig table and the second pulse angular displacement transmitter is coupled mechanically to said second motion screw which moves said second jig table; an element of said first pulse angular displacement transmitter sensing the revolutions of said first motion screw and converting then into actions; sensors of said first pulse angular displacement transmitter which react to said actions of said element of said first angular displacement transmitter sensing the revolutions of said first motion screw, the number of said actions produced by said element of the first pulse angular displacement transmitter as per every revolution of said first motion screw being different for everyone of said sensors that react to these actions; an element of said second pulse angular displacement transmitter sensing the revolutions of said second motion screw and converting them into actions; sensors of said second pulse angular displacement transmitter reacting to said actions of said element of said second pulse angular displacement transmitter sensing the revolutions of said second motion screw, the number of said actions produced by said element of said second pulse angular displacement transmitter as per every revolution of said second motion screw being different for everyone of said sensors reacting to these actions; a counter-commutator; a first shaper-amplifier of pulses of said counter-commutator, the input of which is connected to the output of all said sensors of said first pulse angular displacement transmitter; a second shaper-amplifier of pulses of said counter-commutator the input of which is connected to the output of all said sensors of said second pulse angular displacement transmitter; a first pulse counter of said counter-commutator the number of digits in which corresponds to the number of said sensors of said first pulse angular displacement transmitter and the input of which is connected to the output of said first pulse amplifier-shaper; a second pulse counter of said counter-commutator the number of digits in which corresponds to the number of said sensors of said second pulse angular displacement transmitter and the input of which is connected to the output of said second pulse shaper-amplifier; a trigger of said counter-commutator with a first and a second inputs and an output, said first input being connected to the output of said first pulse counter and said second input being connected to the output of said second pulse counter; a relay of said counter-commutator with a first and a second outputs and an input connected to said output of said trigger, the first output of said relay being connected to the third input of said first motor controller and the second output of said relay being connected to the third input of said second motor controller; a commutation circuit of said counter-commutator the input of which is connected to the fifth output of said input memory unit and the output of which is connected to the inputs of all said sensors.

4,051,423
SERVO SYSTEM WITH FEEDBACK SIGNAL COMPENSATION

James J. Touchton, Santa Clara; John Cuda, Saratoga, and Frank J. Sordello, Los Gatos, all of Calif., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 10, 1976, Ser. No. 656,897
Int. Cl.[2] G05B 5/01
U.S. Cl. 318—611 10 Claims



1. A servo system for controlling the energization of an actuator employed to move a movable member in response to a cyclic power signal for positioning the movable member in accordance with a desired position signal, said system comprising:

position detecting means for generating a signal responsive to the present position of said movable member;

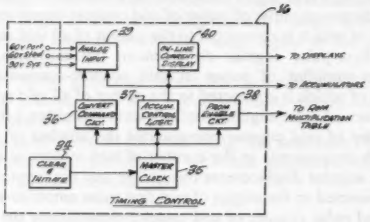
servo control means for comparing the desired and present position signals to generate a position error signal for controlling the magnitude and polarity of said cyclic power signal energizing said actuator to move said member toward the desired position; and

attenuation means for reducing the magnitude of a portion of each cycle of said error signal after a predetermined time period and to a predetermined magnitude to attenuate said cyclic signal without causing a substantial phase shift thereof.

4,051,424
DIGITAL AMP-HOUR MONITOR

James A. Privee, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 13, 1976, Ser. No. 704,906
Int. Cl.[2] H01M 45/06
U.S. Cl. 320—48 6 Claims



1. A battery monitor system comprising:

input circuit means adapted to make connection with a battery pack for producing an electrical analog of the current therefrom;

digital panel meter means connected to said input circuit means for converting the output thereof to a binary code digital signal and displaying the display analog thereof;

first signal converter means connected to said digital panel meter means for converting the binary code digital signal output to a binary signal;

read-only-memory means connected to said first signal converter means and programmed to serve as a multiplication table storing the product of a time interval and a current corresponding to the binary input signal;

accumulator circuit means connected to said read-only-memory for summing the product outputs thereof;

second signal converter means connected to said accumulator circuit means for converting the digital output signal therefrom to a binary code signal;

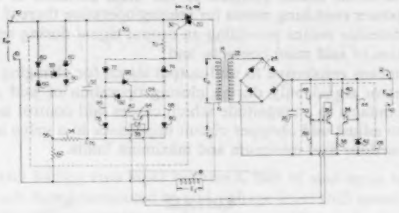
panel display means connected to said second signal converter means for providing a visual read out; and

timing control means connected to each of the aforerecited means for providing a timing signal therefor.

4,051,425
AC TO DC POWER SUPPLY CIRCUIT

Jerry L. Smith, Broad Brook, Conn., assignor to Telephone Utilities and Communications Industries, Inc., Chester, Conn.

Filed Feb. 3, 1975, Ser. No. 546,555
Int. Cl.[2] H02M 1/08
U.S. Cl. 363—86 14 Claims



1. A power supply circuit for converting alternating current power into a voltage regulated direct current output, said power supply circuit comprising a pair of input terminals for connection to a source of AC power and a pair of output terminals for connection to a DC load, a transformer with a primary winding and a secondary winding, a phase control switching means an an inductor connected in series with one another and with said primary winding across said input terminals, a rectifier having an input connected across said secondary winding and an output connected across said two output terminals, a filter capacitor connected across said two output terminals, and a voltage regulating means responsive to the DC output voltage appearing across said output terminals for controlling the firing angle of said phase control switching means so as to maintain said DC output voltage at a desired value, said inductor being one which does not saturate during any half cycle of the voltage waveform of said AC power source even when said output terminas are shorted, and said transformer having a core of an optimally small size capable of supporting volt-time integrals associated with normal firing angles without saturating but incapable of supporting volt-time integrals associated with abnormally small firing angles whereby said core is of substantially smaller size than the size required to support volt-time integrals associated with such abnormally small firing angles and whereby in the event of said core saturating said inductor imposes an impedance to limit current through said primary winding.

4,051,426
SHOOT THROUGH PROTECTED CURRENT DRIVEN TRANSISTOR INVERTER CIRCUIT

Peter Wood, Murrysville, Pa., assignor to White-Westinghouse Corporation, Cleveland, Ohio

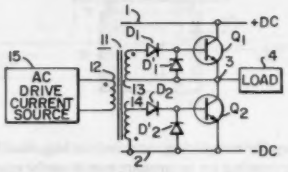
Continuation of Ser. No. 475,234, May 31, 1974, abandoned.
This application Oct. 9, 1975, Ser. No. 621,034
Int. Cl.[2] H02M 7/537
U.S. Cl. 363—131 4 Claims

1. An inverter circuit operative with a direct current power source having a pair of terminals of opposite polarities and with an alternating current load comprising:

first and second transistor switching means each having a

base electrode, an emitter electrode and a collector electrode, said emitter electrode of said first transistor switching means being electrically connected to said collector electrode of said second transistor switching means and to said load, said collector electrode of said switching means being electrically connected to one of said terminals, said emitter electrode of said second switching means being electrically connected to the other of said terminals;

transformer means having at least two secondary windings each for applying alternating current to one of said base electrode one of said secondary windings being electrically connected to said base electrode of said first transistor switching means, the other of said secondary windings being electrically connected to said base electrode of said second transistor switching means,



first diode means electrically connected in series relationship between one of said secondary windings and one of said base electrodes and second diode means electrically connected in series relationship between the other of said secondary windings and the other of said base electrodes, one of said first and second diode means being in a conducting condition when the other of said first and second diode means is in a non-conducting condition, said first and second diode means conducting reverse current after said first and second transistor switching means are in a non-conducting condition,

another diode means for supplying reverse current to said first and second diode means, said another diode means being in a non-conducting condition when said first and second diode means are in a non-conducting condition.

4,051,427

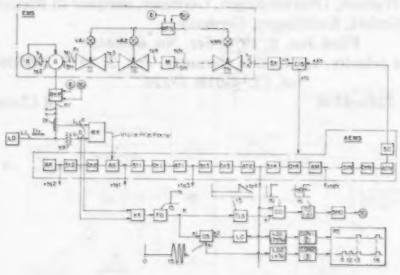
SUPERVISORY SYSTEM FOR DETECTING TORSIONAL OSCILLATION IN THE SHAFT OF A ROTATING ELECTRO-MECHANICAL SYSTEM

Lee A. Kilgore, Export; Edgar R. Taylor, Jr., Pittsburgh, and William H. South, McKeesport, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 29, 1974, Ser. No. 518,915

Int. Cl.[2] H02H *7/06;* **G01M** *7/00;* **G01H** *1/08*

U.S. Cl. 322—99 **12 Claims**



1. An analog supervisory system for simulating the torsional oscillation characteristic of an electro-mechanical power generating system, which latter system has rotatable masses therein which are interconnected by rotatable shaft, said shaft having mechanical resilience, said electro-mechanical system having mechanical damping, said mechanical resilience, said mechanical damping and said masses having the capability of causing torsional oscillation in said shaft when said shaft rotates, said generating system having an output electrical generator with terminals, comprising:

transducer detecting means interconnected with said electro-mechanical system for measuring the real component of electrical power provided at said terminals of said output electrical generator in said electro-mechanical system for thus detecting shaft torque in a local part of said shaft and thus providing an output signal having a value related to said local shaft torque;

analog simulating means adjusted to represent said masses, said shaft damping and said resilience of said electro-mechanical system, said transducer detecting means output signal being provided to said analog simulating means to cause said analog simulating means to thereby simulate a torsional oscillation in said shaft relative to any of said masses;

shut-down means interconnected with said analog simulating means and said electro-mechanical system to shut said electro-mechanical system down if a predetermined torsional oscillation value is achieved; and

fault detecting means for detecting an electrical fault current at said terminals of said output electrical generator, a signal having a value which is relative to said fault being provided by said fault detecting means to said shut-down means to disable the shut-down of said electro-mechanical system until the effect on said generator of said fault has been reduced.

4,051,428

CURRENT CONTROL CIRCUIT WITH CURRENT PROPORTIONAL CIRCUIT

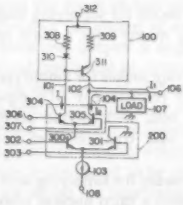
Kunio Imai, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed Mar. 12, 1976, Ser. No. 666,416

Claims priority, application Japan, Mar. 12, 1975, 50-29021

Int. Cl.[2] G05F *3/08;* **H03K** *5/01, 13/22;* **H03D** *13/00*

U.S. Cl. 323—4 **7 Claims**



1. A current control circuit comprising:

first means, having first and second terminals, for controlling currents such that the current flowing into the first terminal is in a proportional relationship with the current flowing into the second terminal;

second means, connected between the first terminal of said first means and a common potential terminal, from which an output signal is delivered;

third means for supplying a constant current to each of said first and second terminals; and

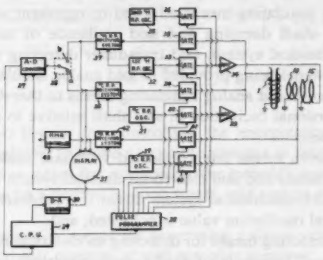
fourth means connected between said first and third means for selectively steering the constant current from said third means to one of said first and second terminals of said first means in response to a first digital input information signal applied to said fourth means.

4,051,429

NUCLEAR MAGNETIC RESONANCE APPARATUS

Mamoru Imanari; Makoto Takeuchi; Shozo Shimizu, and Hisashi Higuchi, all of Tokyo, Japan, assignors to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 2, 1976, Ser. No. 654,527
Claims priority, application Japan, Feb. 4, 1975, 50-14663; Mar. 17, 1975, 50-32051; Mar. 18, 1975, 50-32705
Int. Cl.[2] G01R *33/08*
U.S. Cl. 324—.5 A 15 Claims



1. In a nuclear magnetic resonance apparatus for producing two types of spectrums the improvements comprising:

a. a trans-receiver coil arranged perpendicularly with respect to the static magnetic field H_0,

b. an internal lock trans-receiver coil interposed along a third axis perpendicular to both the static magnetic field H_0 and said trans-receiver coil axis,

c. a transmission coil arranged along the same axis as the internal lock trans-receiver coil,

d. a means for tuning said trans-receiver coil to a first nuclear resonance frequency or a second nuclear resonance frequency,

e. a transmitting means for supplying said trans-receiver coil or transmission coil with a burst first nuclear resonance RF,

f. a first receiving means for amplifying and detecting a first nuclear resonance F.I.D. signal induced in said trans-receiver coil by the burst of said first RF said first receiving means being connected to said trans-receiver coil via tuning means,

g. a transmitting means for supplying said trans-receiver coil via said tuning means with a burst of a second nuclear resonance RF,

h. a second receiving means for amplifying and detecting the second nuclear resonance F.I.D. signal induced in said trans-receiver coil, said second receiving means being connected to said trans-receiver coil via said tuning means,

i. a transmitting means for supplying said internal lock trans-receiver coil with a third nuclear resonance RF,

j. a third receiving means for amplifying and detecting a third nuclear resonance signal induced in said internal lock trans-receiver coil, said third receiving means being connected to said internal lock trans-receiving coil and to a means for stabilizing the static magnetic field,

k. an adjustable transmitting means for supplying said transmission coil with a nuclear RF pulse so as to decouple a selected nucleus,

l. a means for Fourier transforming the output signal from said first or second receiving means, and

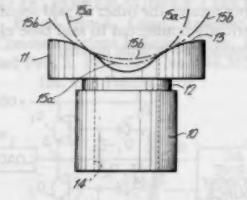
m. a means for displaying said Fourier transformed signals whereby the adjustable transmitting means may be adjusted until observation of decoupling of a selected nucleus on one Fourier transformed spectrum and then the other spectrum may be observed with the selected nucleus decoupled without change of apparatus conditions.

4,051,430

APPARATUS FOR MEASURING, AND INDICATING, THE THICKNESS OF A NON-METALLIC COATING OF AN ARCUATE METAL SURFACE

Louis Guy Millette, Pointe Claire; Peter Murphy, Longueuil, and Georges Michel Miller, Chateauguay, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed June 21, 1976, Ser. No. 698,009
Claims priority, application Canada, Apr. 30, 1976, 251592
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—34 TK 3 Claims



1. Apparatus for measuring, and indicating, the thickness of a non-metallic coating on an arcuate metal surface, comprising:

at least one measuring head for positioning relative to said coating;

at least one support member on each measuring head for supporting said measuring head relative to said coating;

a sensing member on each measuring head and arranged to develop a signal representative of the distance between said sensing member and said arcuate metal surface;

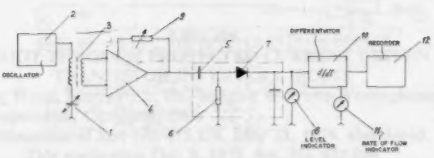
a profiled surface on said support member for presentation to said coating, said profiled surface having a V shape with convex arcuate sides when viewed in a direction parallel to the axis of the arcuate metal surface, the arcuate sides initially defined by sequentially positioning a series of metal cylindrical mandrels of different diameters relative to the sensing member with the axes of the mandrels lying in a common plane normal to the sensing member, so as to develop a signal of the same magnitude from the sensing member for each mandrel, each arcuate side being a curve which is tangential to the peripheries of the mandrels at these respective positions, the penetration of said arcuate metal surface and coating into said V shape varying with the outer diameter of the coating to offset variations in the signal resulting from variations in the outer diameter of the non-metallic coating.

4,051,431

APPARATUS FOR MEASURING RATES OF URINE FLOW ELECTRICALLY

Helmut Wurster, Oberderdingen, Germany, assignor to Richard Wolf GmbH, Knittlingen, Germany

Filed Jan. 5, 1976, Ser. No. 646,445
Claims priority, application Germany, Jan. 3, 1975, 2500094
Int. Cl.[2] G01R *27/26*
U.S. Cl. 324—61 R 8 Claims



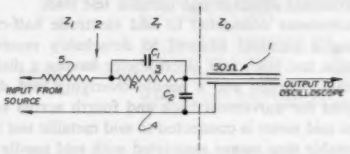
8. A method of determining the flow rate (F(t)) of urine comprising, immersing an electrical capacitor in a vessel for receiving the urine, said capacitor having a capacitance which varies with the level of urine, interposing the capacitor in an electrical differentiating circuit which emits signals corre-

sponding to the rate of change in capacitance, varied by the level of urine, and deriving from said signals the urine flow rate equivalent.

4,051,432
ATTENUATOR FOR MEASURING HIGH VOLTAGE FAST RISE TIME PULSES

Walter J. Sarjeant, Ottawa, Canada, assignor to Canadian Patents & Development Limited, Ottawa, Canada

Filed Aug. 2, 1976, Ser. No. 710,786
Int. Cl.[2] G01R *31/02*; H01P *1/22*
U.S. Cl. 324—72.5 **7 Claims**



1. An attenuator for measuring high voltage pulses from point voltage sources comprising:

coaxial connector means having a first central conductor, for connecting the attenuator to a coaxial line;

resistance means having one end connected to the central conductor, said resistance means being enclosed within a conducting shield to form a transmission line section;

terminal means for connecting the attenuator to the point voltage source to be measured, said terminal means being connected to the resistance means by a second central conductor;

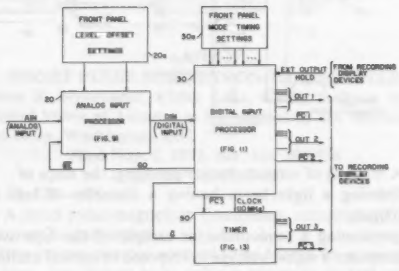
frequency dependent distributed resistance means mounted on the second central conductor, said frequency independant resistance being substantially resistive at frequencies greater than 10 MHz, to maintain frequency independent attenuation of the attenuator and to absorb reflected energy from the attenuator; and

ground conductor means fixed to the conducting shield for connecting the shield to the point voltage source ground.

4,051,433
SIGNAL RESPONSIVE BURST PERIOD TIMER AND COUNTER FOR LASER DOPPLER VELOCIMETRY AND THE LIKE

Paul E. Dimotakis, Altadena, and Daniel B. Lang, Pasadena, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Sept. 11, 1975, Ser. No. 612,269
Int. Cl.[2] G01R *23/02*
U.S. Cl. 324—78 R **30 Claims**



1. A method of detecting and qualifying a first and each successive cycle of a signal as to a criterion relating to voltage amplitude for accurate timing of the period of each succeeding cycle, comprising the steps of

comparing said signal with voltages of first and second levels with respect to a reference to determine when said signal exceeds said voltages in a predetermined order of the first level followed by the second level and then a reference crossing, and always in that order, to determine the presence of a valid cycle,

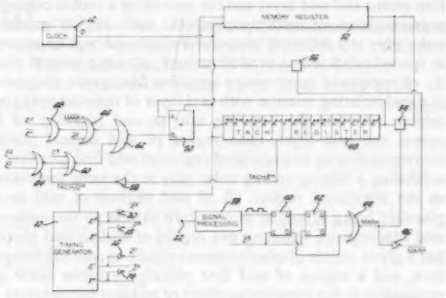
detecting the time said signal crosses said reference in a direction from the second one of said two levels for each cycle, and

producing a pulse for each cycle qualified, said pulse having a voltage transition coincident with said reference crossing.

4,051,434
DIGITAL FREQUENCY MEASURING CIRCUITRY

Douglas W. Sweet, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 28, 1976, Ser. No. 690,848
Int. Cl.[2] G01R *23/02*
U.S. Cl. 324—78 D **6 Claims**

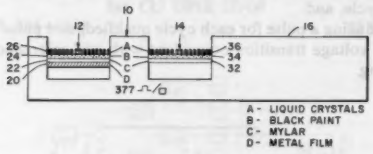


1. Digital frequency measuring circuitry for developing a binary word related to the frequency of a pulsating input signal comprising a serial-in serial-out accumulator register, said accumulator register comprising first and second serial-in serial-out shift registers, the output of said first shift register being connected with the input of said second shift register, means for complementing the output of said first register for providing a complemented output, a single bit serial adder having first and second inputs and an output, said second input being connected with the output of said second shift register, said output of said adder being connected with the input of said first shift register, clock means for establishing a fixed computation cycle the frequency of which is substantially higher than the highest frequency input signal to be measured, means responsive to said clock means for developing a serial bit stream corresponding to a predetermined binary number, gate means having inputs connected with said complemented output of said first register and with said means for generating said binary number, said clock means controlling said gate means to connect the complemented output of said first register to said first input of said adder during a portion of each computation cycle said gate means also responsive to said pulsating signal for passing said predetermined binary number to said first input of said adder during at least one of the computation cycles occurring each cycle of said input signal, a serial-in serial-out memory register, means responsive to said input signal for transferring the word in said accumulator register to said memory register each cycle of said input signal, whereby the binary word stored in said accumulator register is increased by a constant amount each cycle of said input signal and said binay word is decreased by a predetermined proportion each computation cycle.

4,051,435
MICROWAVE FIELD DETECTOR

Glenn Ellsworth Fanslow, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Oct. 18, 1976, Ser. No. 733,219
Int. Cl.[2] G01R 21/04, 5/22; G02F 1/13
U.S. Cl. 324—95 20 Claims

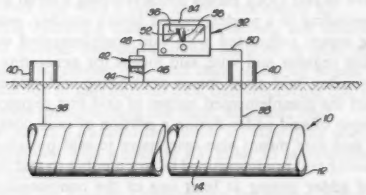


1. A detector for determining the intensity of a microwave field comprising: a layer of resistive material adapted to receive said microwave field for providing induced internal electrical currents in response thereto thereby establishing a temperature on said layer corresponding to the microwave field; a first plurality of regions of temperature sensitive film means disposed in thermal conducting relation with said layer of resistive material for facilitating heat transfer between said film means and said layer and for providing a visible color play representative of said temperature, each region exhibiting color play at a different temperature and said regions arranged in spaced relation in a predetermined pattern; a second plurality of regions of temperature sensitive film means disposed in thermal isolating relation with said layer of resistive material to inhibit heat transfer between said second plurality of film means and said layer, each region of said second plurality corresponding to an associated region of said first plurality and exhibiting a corresponding color play at the same temperature as the associated region, all of said regions of said second plurality being arranged in a pattern similar to the pattern of said first regions; whereby one region of said second plurality has a given visible display responsive only to ambient temperature, and a region of said first plurality exhibits color play responsive to the cumulative effect of ambient temperature and heating in the resistive layer due to incident microwave energy, the difference in color play of said first and second plurality of regions being a measure of the intensity of microwave energy.

4,051,436
APPARATUS FOR AND METHOD OF MEASURING POLARIZATION POTENTIAL OF A METALLIC STRUCTURE

Casper J. Weir, Jr., Rte. 3, Box 215-B, San Luis Obispo, Calif. 93401

Filed Apr. 14, 1976, Ser. No. 676,710
Int. Cl.[2] G01R 19/00, 1/14
U.S. Cl. 324—102 8 Claims



1. An improved portable testing system for measuring the polarization potential of a metallic structure to determine if existing proper electrical current is presently being applied to said metallic structure to assure adequate cathodic protection of said metallic structure, wherein said cathodic protection is independently accomplished through at least one drain station in which the metallic structure is in contact with an electrolytic environment, a metallic lead from said metallic structure to an external normally energized power source, a metallic lead from said power source to an anode within said electrolytic environment, and a current interrupter is associated with said external normally energized electrical power source which can be activated to turn said power source off for a predetermined momentary period of time for testing said polarization potential and then on again, in which said portable testing system includes:

at least one metallic test lead projecting from said metallic structure through said electrolytic environment for external access away from said drain station;

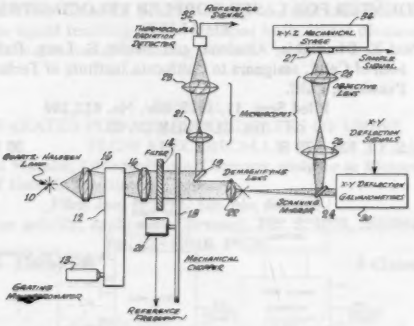
an electrode half-cell adapted to contact said electrolytic environment adjacent said metallic test lead;

an electrometer connected to said electrode half-cell and having a terminal adapted to detachably receive said metallic test lead, said electrometer having a dial incrementally marked and a needle overlying said dial and adapted for movement back and fourth across said dial when said meter is connected to said metallic test lead, an adjustable stop means associated with said needle to prevent excursion of said needle across said dial in one direction to an incremental value when said power source is on, yet maintain said needle at an optimum incremental polarization potential value to acheive more nearly true indication of an instantaneous off when said power is momentarily off to visually determine if said needle remains relatively fixed which in turn indicates existing current is adequate.

4,051,437
METHOD AND APPARATUS FOR SEMICONDUCTOR PROFILING USING AN OPTICAL PROBE

Derek L. Lile, and Neil M. Davis, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 2, 1976, Ser. No. 673,223
Int. Cl.[2] G01R 31/26
U.S. Cl. 324—158 R 10 Claims



1. A method of semiconductor profiling, the steps of

a. forming a light beam having a diameter of less than 100μm,

b. positioning a semiconductor sample of the type which generates a signal voltage in response to optical excitation in an electrolytic solution,

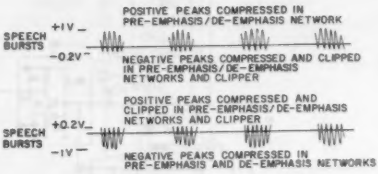
c. scanning said light beams over said sample in a raster format;

d. utilizing the signal voltages generated by said sample in response to being scanned by said light beam to determine the presence of anomalities in said sample.

4,051,438
CO-CHANNEL MULTIPLE SIGNAL BROADCASTING SYSTEM

Robert B. Pickett, Lompoc, Calif., and Elie J. Baghdady, Weston, Mass., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Sept. 11, 1975, Ser. No. 612,391
Int. Cl.² H04H *1/00*
U.S. Cl. 325—45 **5 Claims**


POSITIVE PEAKS COMPRESSED IN PRE-EMPHASIS/DE-EMPHASIS NETWORK
SPEECH BURSTS
+1V
-0.2V
NEGATIVE PEAKS COMPRESSED AND CLIPPED IN PRE-EMPHASIS/DE-EMPHASIS NETWORKS AND CLIPPER
POSITIVE PEAKS COMPRESSED AND CLIPPED IN PRE-EMPHASIS/DE-EMPHASIS NETWORKS AND CLIPPER
SPEECH BURSTS
+0.2V
-1V
NEGATIVE PEAKS COMPRESSED IN PRE-EMPHASIS AND DE-EMPHASIS NETWORKS

1. A co-channel multiple signal broadcasting system to suppress co-channel interference in overlapping areas of transmission signals comprising:

at least two angularly modulated transmitters disposed in spaced relation with respect to each other such that their respective transmission signals have at least one overlapping area, each of said two transmitters transmitting identical speech bursts by angularly modulating a carrier signal having a given carrier frequency;

first means disposed in one of said two transmitters to deviate its associated carrier frequency in primarily a first given direction; and

second means disposed in the other of said two transmitters to deviate its associated carrier frequency in primarily a second given direction opposite said first given direction;

the opposite deviations of said carrier frequencies of said two transmitters providing an effective root mean square separation of said carrier frequencies of said two transmitters to suppress said co-channel interference;

said first means including

a first source of said identical speech bursts,

a first pre-emphasis network coupled to said first source,

a base clipper coupled to said first pre-emphasis network, and

a first de-emphasis network coupled to said base clipper; and

said second means including

a second source of said identical speech bursts,

a second pre-emphasis network coupled to said second source,

a peak clipper coupled to said second pre-emphasis network, and

a second de-emphasis network coupled to said peak clipper.

4,051,439
SHORT PULSE MAGNETRON TRANSMITTER

Reuben E. Nyswander, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 2, 1972, Ser. No. 304,574
Int. Cl.² H04B *1/04*
U.S. Cl. 325—121 **6 Claims**

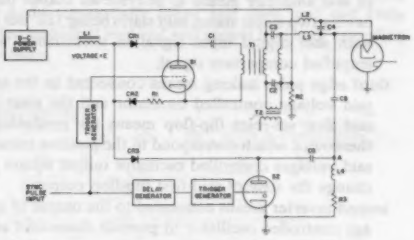
1. A short pulse magnetron transmitter, comprising:

a control signal input;

a long pulse generator coupled to said input for generating a long, low power level pulse in response to said control signal;

a short pulse generator coupled to said input for generating a short, high power level pulse in response to said control signal, including means for delaying the generation of said short, high power level pulse;

a magnetron coupled to said long pulse generator and said short pulse generator such that said magnetron is placed in oscillation by said long, low power level pulse and is

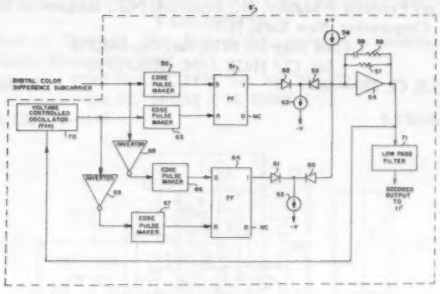


driven to high power by said short, high power level pulse.

4,051,440
PHASE LOCKED DEMODULATOR

Larry A. Nelson, Hillsboro, and Philip Stephen Crosby, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Division of Ser. No. 504,415, Sept. 9, 1974, abandoned, which is a division of Ser. No. 360,519, May 15, 1973, Pat. No. 3,863,254. This application Mar. 4, 1976, Ser. No. 663,663
Int. Cl.² H03B *3/04*; H03D *13/00, 3/00*; H03K *9/06*
U.S. Cl. 328—134 **4 Claims**



1. A circuit for providing a voltage output which depends on the phase difference between a digital input signal corresponding to a frequency modulated signal and a voltage controlled oscillator, comprising:

edge pulse making means for producing pulses corresponding to the positive transitions of said input signal;

inverting means for inverting said input signal;

second edge pulse making means for producing pulses corresponding to the negative transitions of said input signal;

digital means defining a set-reset flip-flop having its set input connected fto the output of said first edge pulse making means to produce an output thereoutof which directly corresponds to positive excursions of said digital input signal;

second digital means defining a set-reset flip-flop having its set input connected to the output of said second edge pulse making means to produce an output thereoutof which directly corresponds to negative excursions of said digital input signal;

switch means defining diodes in pairs and having separate current sources connected to the outputs of said first and second digital means to route a comparison current in accordance with the output of said first and second digital means;

amplifier means defining an operational amplifier connected

to the output of said switch means for amplifying said comparison of said switch means;

voltage controlled oscillator means connected to the output of said amplifier means to provide an output thereoutof having two stable states, said states being 180° out of phase with said digital input signal in accordance with said amplified comparison signal;

third edge pulse making means connected to the output of said voltage controlled oscillator and the reset input of said first set-reset flip-flop means for producing pulses thereoutof which correspond to the positive excursions of said voltages controlled oscillator output square wave to change the state of said first flip-flop output;

second inverter means connected to the output of said voltage controlled oscillator to provide thereoutof an output signal 180° of phase with said voltage controlled oscillator output; and

fourth edge pulse making means connected between the output of said second inverter means and the reset input of said second set-reset flip-flop means for producing pulses thereoutof which correspond to the negative excursions of said voltage controlled oscillator output square wave to change the state of said second flip-flop output.

4,051,441

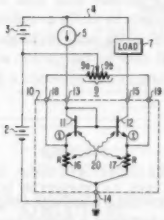
TRANSISTOR AMPLIFIERS

Carl Franklin Wheatley, Jr., Somerset, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 21, 1976, Ser. No. 688,578

Int. Cl.² H03F *3/04*; H03G *3/10*

U.S. Cl. 330—288 **6 Claims**



6. A transistor amplifier for operation in a range of temperature around an absolute temperature T_0, said amplifier comprising:

first and second transistors, each having base and emitter electrodes with a base-emitter junction therebetween and having a collector electrode;

means for maintaining said base electrodes at substantially the same quiescent potential;

a common terminal;

a first resistance connecting the emitter electrode of said first transistor to said common terminal and having a positive temperature coefficient $1/T_0$;

a second resistance connecting the emitter electrode of said second transistor to said common terminal and having a positive temperature coefficient $1/T_0$;

means providing mutual thermal coupling amongst said first transistor, said second transistor, said first resistance and said second resistance for maintaining them at substantially the same operating temperature; and

means other than said transistors for applying temperature independent currents to said two resistance means, in a desired ratio, for controlling the gain of said amplifier.

4,051,442

GAIN CONTROL CIRCUITS FOR AUDIO AMPLIFIERS

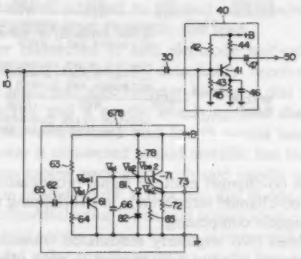
Seishi Yamazaki, Mito, Japan, assignor to Hitachi, Ltd., Japan

Filed Apr. 8, 1976, Ser. No. 675,239

Claims priority, application Japan, Apr. 11, 1975, 50-48205[U]

Int. Cl.² H03G *3/30*

U.S. Cl. 330—281 **18 Claims**



1. A gain control circuit for an audio signal amplifier operatively amplifying audio signals supplied to an audio signal input terminal thereof and providing amplified audio signals at an audio signal output terminal thereof and further having a bias circuit for supplying bias voltage to said amplifier to control amplifying gain thereof,

said gain control circuit comprising:

a. a detection circuit supplied at an input terminal thereof with the audio signals for decreasing and increasing output impedance thereof in accordance with the increasing and decreasing of said audio signals, respectively;

b. a first capacitor connected across said detection circuit so as to form a first discharging circuit therewith while said detection circuit is conductive;

c. a power source and a first resistor connected in series with said first capacitor to form a first charging circuit therewith, so that said first capacitor is charged up by said power source through said first resistor while said detection circuit is not conductive;

d. a second capacitor and a second resistor connected in parallel to form a second discharging circuit, the time constant of said second discharging circuit being larger than that of said first discharging circuit;

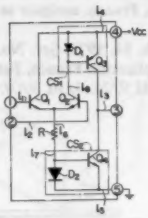
e. a switching circuit connected in series with said second discharging circuit, said series connected switching circuit and said second discharging circuit being coupled across said detecting circuit, and being also connected in series to said power source through said first resistor to form a second charging circuit therewith, so that said second capacitor is charged up by said power source while said switching circuit is conductive; and

f. a control circuit having input terminal supplied with output potential of said detection circuit and output terminal connected to said bias circuit, said control circuit providing at the output terminal thereof a control voltage the potential of which varies in dependence upon the potential supplied to the input terminal thereof thereby to correspondingly control the bias voltage of said bias circuit for controlling the gain of said amplifier.

4,051,443
DIFFERENTIAL AMPLIFIER

Kunio Seki; Yukio Suzuki, both of Tokyo, and Yoshio Sakamoto, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed May 28, 1976, Ser. No. 691,100
Claims priority, application Japan, Oct. 6, 1975, 50-119765
Int. Cl.[2] H03F *3/45*
U.S. Cl. 330—258 9 Claims



1. A differential amplifier comprising a pair of differential amplifying elements each having an input electrode, a ground electrode and an output electrode, a first power supply terminal, a second power supply terminal, a common impedance means, a first current source means including a first diode means and a first transistor of a first conductivity type, a second current source means including a second diode means and a second transistor means of a second conductivity type, and an output terminal, the ground electrodes of said two differential amplifying elements being connected in common to one end of said common impedance means, said second diode means being connected between the other end of said common impedance means and said second power supply terminal, said second transistor having a base and an emitter connected to the other end of said common impedance means and the second power supply terminal, respectively, said first diode means being connected between said first power supply terminal and the output electrode of one of said two differential amplifying elements, said first transistor having a base and an emitter connected to the output electrode of said one of the two differential amplifying elements and said first power supply terminal, respectively, said output terminal being connected to the collectors of said first and second transistors and deriving a differential output signal current of the two signals applied to the respective input electrodes of said two differential amplifying elements, the operationally effective pn-junction area of said first diode means being selected substantially equal to that of said first transistor, and the operationally effective pn-junction area of said second diode means being selected substantially equal to twice of that of said second transistor.

4,051,444
AMPLIFIER STRUCTURE FOR LOW-LEVEL VOLTAGE MEASUREMENTS

Heinz Walter Gruner, Rochester, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

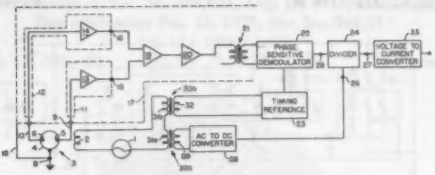
Continuation of Ser. No. 541,456, Jan. 16, 1975, abandoned, which is a division of Ser. No. 254,000, May 17, 1972, Pat. No. 3,902,366. This application June 7, 1976, Ser. No. 693,258
Int. Cl.[2] H03F *1/00*
U.S. Cl. 330—68 6 Claims

1. An amplifier module having amplifier structure, shielding structure, and housing structure;

said amplifier structure including an input lead, an output lead, and a circuit board for carrying an amplifier whose input terminal and output terminal are connected to said leads for amplifying an input voltage from a source of low-level voltage applied to said input lead and producing a corresponding output voltage on said output lead, said circuit board including said terminals of said amplifier;

said shielding structure comprising an electrically conductive shell enveloping said input lead and said circuit board;

said housing structure including a body of electrically-insulating potting material enveloping said circuit board, said body substantially filling said shell, and said body having said input lead and said output lead both extending therefrom;



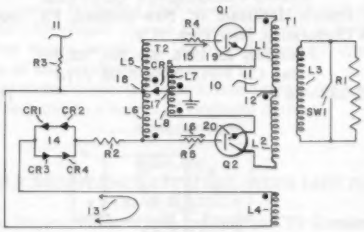
said shell having an electrically-conductive input lead shield DC-connected to said shell; said input lead shield extending from within said shell to said source, said input lead shield extending into said body to said input terminal, and said input lead shield enveloping said input lead, but being electrically insulated therefrom;

said shell being DC-connected to said output lead for maintaining said input lead shield and said shell at the potential of said output voltage.

4,051,445
INVERTER CONVERTER CIRCUIT FOR MAINTAINING OSCILLATIONS THROUGHOUT EXTREME LOAD VARIATIONS

Robert J. Boschert, San Jose, Calif., assignor to Boschert Assoc., Sunnyvale, Calif.

Filed Nov. 22, 1976, Ser. No. 743,859
Int. Cl.[2] H02M *3/28;* H03K *3/16*
U.S. Cl. 331—113 A 5 Claims



1. A two transistor magnetically coupled multivibrator for use with power supplies capable of maintaining oscillations under extreme load conditions comprising:

a conventional multivibrator with a collector driven output transformer having load windings and transistor base drive feedback windings,

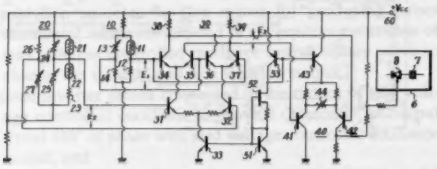
a base drive transformer in addition to the said output transformer having primary windings powered by emitter currents of the two transistors, and having secondary windings connected to drive the base/emitter circuits of the two transistors and powered by feedback from both the output transformer feedback windings and the said base drive transformer primary windings,

and an electronic means of disconnecting the said output transformer feedback windings from the said base drive transformer upon the occurrence of a load short circuit so that the electrically "dead" output transformer is thereafter prevented from drawing power from the said base drive transformer and oscillations will continue solely due to feedback within the said base drive transformer.

4,051,446
TEMPERATURE COMPENSATING CIRCUIT FOR USE WITH A CRYSTAL OSCILLATOR

Masanao Owaki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 16, 1976, Ser. No. 678,031
Claims priority, application Japan, Apr. 23, 1975, 50-49241
Int. Cl.[2] H03B 5/04, 5/36
U.S. Cl. 331—116 R 8 Claims



1. A temperature compensating circuit for use with a crystal oscillator, comprising:

a. an oscillation circuit;

b. a first bridge circuit for generating a first DC voltage having a linear functional temperature characteristic and including at least one temperature responsive variable resistance element;

c. a second bridge circuit for generating a second DC voltage having a quadratic functional temperature characteristic and including at least two temperature responsive variable resistance elements;

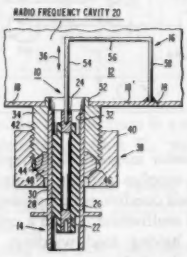
d. means for multiplying said first DC voltage by said second DC voltage so as to generate a third DC voltage having a cubic functional temperature characteristic; and

e. means for applying said third DC voltage to said oscillation circuit.

4,051,447
RADIO FREQUENCY COUPLER

LeRoy Francis Heckman, Jr., New Holland, Pa., assignor to RCA Corporation, New York, N.Y.

Filed July 23, 1976, Ser. No. 708,095
Int. Cl.[2] H01P 5/04, 5/08, 1/16
U.S. Cl. 333—24 R 11 Claims



1. In combination,

first transmission means including a first conductor,

second transmission means including a second conductor having an end extending therefrom,

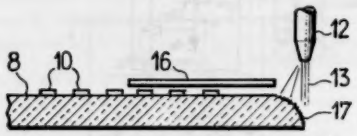
means for securing said extended end to said first conductor with said second conductor formed into an inductive coupling loop having an inductive coupling value defined by a settable transverse area value and a settable depth value for coupling a radio frequency signal between said first and second means, said loop having a given orientation with respect to said first means, and

means for flexing said extended end to alter said loop coupling vaue while maintaining said given orientation to thereby provide optimum coupling between said first and second transmission means.

4,051,448
SURFACE ACOUSTIC WAVE TRANSMISSION DEVICE AND METHOD OF MANUFACTURING SAME

Gerard Coussot, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 14, 1975, Ser. No. 550,036
Claims priority, application France, Feb. 15, 1974, 74.05202
Int. Cl.[2] H03H 9/26, 9/30, 9/04; H01L 41/22
U.S. Cl. 333—30 R 10 Claims

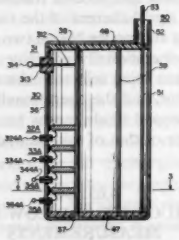


1. Surface acoustic wave transmission device comprising: a substrate having at least one smooth face for propagating said waves, the edge of said substrate located on the trajectory of said waves, being a ground scattering edge resulting from cutting said edge in a wafer using a jet of abrasive particles directed on to said smooth face; the mean profile of said ground scattering edge having a radiused form merging in said smooth face.

4,051,449
TIME FREQUENCY DIVERSITY SYSTEM

George C. Fincke, West Allenhurst, and George W. Taylor, Brielle, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 12, 1976, Ser. No. 731,159
Int. Cl.[2] H01P 1/20, 7/04, 3/08
U.S. Cl. 333—73 C 10 Claims



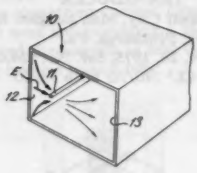
1. A time-frequency diversity system comprising a plurality of sources of input signals of differing frequencies; a broad band amplifier; means for coupling said plurality of sources of input signals to the input of said broad band amplifier; a fast-tuned filter; means for coupling the output of said broad band amplifier to the input of said fast-tuned filter; an output load; means for coupling the output of said fast-tuned filter to said output load; said fast-tuned filter comprising a coaxial filter; means for tuning said coaxial filter comprising a plurality of inductive spokes positioned at various intervals between the inner and the outer coaxial conductors of said coaxial filter; and means for connecting and disconnecting said inductive spokes between said inner and outer conductors of said coaxial filter.

4,051,450

WAVEGUIDES

Harold Everard Monteagle Barlow, Epsom, England, assignor to National Research Development Corporation, London, England

Filed Apr. 1, 1976, Ser. No. 672,600
Claims priority, application United Kingdom, Apr. 3, 1975, 13691/75
Int. Cl.[2] H01P 1/16, 3/12, 3/20
U.S. Cl. 333—95 R 26 Claims



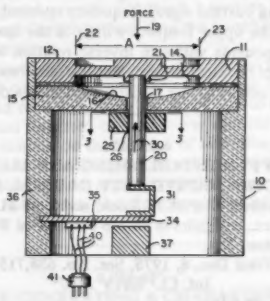
1. Apparatus for supporting electromagnetic waves including a hollow dielectric filled member having generally planar inner conducting walls defining an elongated space of substantially constant cross-section, and at least one elongated conductor passing along the length of the space between and parallel to first and second facing walls, the conductor being positioned relatively near the first wall and relatively far from the second wall, and the apparatus being such that electromagnetic waves are able to propagate principally in the region between the conductor and the first wall.

4,051,451

BEAM TYPE TRANSDUCERS EMPLOYING DUAL DIRECTION FORCE LIMITING MEANS

Anthony D. Kurtz, Englewood; Joseph R. Mallon, Alpine, and Amnon Brosh, Demarest, all of N.J., assignors to Kulite Semiconductor Products, Inc., Ridgefield, N.J.

Filed Sept. 22, 1976, Ser. No. 725,418
Int. Cl.[2] H01L 10/10
U.S. Cl. 338—42 15 Claims



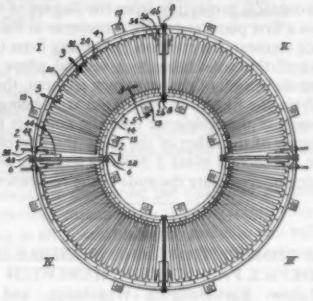
1. In a beam type transducer of the type employing a deflectable beam having at least one force responsive element positioned on a surface thereof, a rod having one end coupled to said beam and said other end coupled to a semiconductor diaphragm member, said diaphragm having a central depression with a glass sheet covering said depression and having a central aperture through which said rod as coupled to said diaphragm is directed, said rod capable of transmitting a force applied to said diaphragm to said beam in a positive direction, the improvement therewith of apparatus for stopping said rod for forces applied in a direction opposite to said positive forces, comprising means coupled to said rod and located beneath said aperture to coact with said glass sheet and hence, limit the motion of said rod for said opposite direction forces.

4,051,452

ANNULAR RESISTOR

William R. Luy, Colgate, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Continuation of Ser. No. 605,673, Aug. 18, 1975, abandoned.
This application Jan. 21, 1977, Ser. No. 761,217
Int. Cl.[2] H01C 1/08
U.S. Cl. 338—51 21 Claims



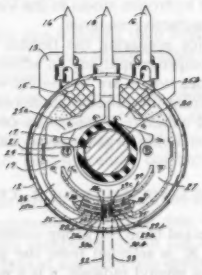
1. A resistor comprising in combination:
a supporting frame having inner and outer annular portions and portions holding them in spaced apart concentric relationship;
insulating means attached to the opposing faces of said inner and outer annular portions;
a reflexed resistance ribbon means having inner and outer U-shaped bends in proximity to said insulating means and segments connecting and arranged in a radial relation between said inner and outer bends;
support means providing individual support for each of said bends with respect to said insulating means to keep said ribbon means within the annulus defined by opposing faces of said insulating means; and
terminal means connected to said ribbon means for connecting the latter to a source of electrical current.

4,051,453

VARIABLE RESISTANCE CONTROL WITH LOW NOISE CONTACTOR

Wayne A. Barden, Elkhart, Ind., assignor to CTS Corporation, Elkhart, Ind.

Filed Feb. 9, 1976, Ser. No. 656,184
Int. Cl.[2] H01C 10/32
U.S. Cl. 338—171 9 Claims



1. A variable resistance control comprising a base having a first surface, an arcuate resistance element carried by the first

surface and provided with at least one terminal for connection to an external circuit, a collector in spaced relationship to the resistance element and provided with a terminal for connection to an external circuit, a contactor wipably engaging the resistance element and the collector and providing an electrical connection therebetween, and means for rotating the contactor, the contactor comprising a body portion, a pair of arms extending outwardly from sides of the body portion and converging toward each other, a plurality of fingers integral with each of the arms, the fingers of one of the arms being in opposing relationship to the fingers of the other of the arms, a contact projecting from each of the fingers and wipably engaging the resistance element along a path intermediate the ends thereof, the contacts projecting from the fingers of one of the arms lying in a first plane generally transverse to the length of the resistance element, the contacts projecting from the fingers of the other of the arms lying in a second plane generally transverse to the length of the resistance element, the contacts projecting from the fingers of one of the arms being closer to one of the ends of the resistance than the contacts projecting from the fingers of the other of the arms, the first plane being spaced from the second plane a distance less than ten percent of the distance intermediate the ends of the resistance element.

4,051,454

ADHESIVE COMPOSITIONS AND FLEXIBLE HEATING DEVICE FABRICATED THEREWITH

Manfred Leiser; Karl-Heinrich Wegehaupt, and Wilhelm Marsch, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Continuation of Ser. No. 443,533, Feb. 19, 1974, abandoned. This application Feb. 3, 1975, Ser. No. 546,246

Claims priority, application Germany, Feb. 16, 1973, 2307776

Int. Cl.[2] H01C *1/14;* **C09J** *5/00*

U.S. Cl. 338—328 **7 Claims**

1. A flexible electrically conducting heating device comprising a heat resistor and a pair of electrodes in contact with and adhered to the surface of the resistor by a cured electrically conductive composition, said conductive composition is obtained from a mixture which consists essentially of (a) a vinyl containing organopolysiloxane having the formula

$$R_2(CH_2{=}CH)SiO\,(R'_2SiO)_n\,Si\,R_2(CH{=}CH_2)$$

wherein R is selected from the group consisting of methyl and phenyl radicals, R′ is selected from the group consisting of methyl, vinyl and phenyl radicals, *n* is a number sufficient to provide an organopolysiloxane having a viscosity of at least 100,000 cP at 25° C, in which 0.1 to 1 mol percent of the diorganopolysiloxane units are vinylmethylsiloxanes and at least 90 percent of the remaining organic radicals consist of methyl radicals, and some or all of the terminal $CH{=}CH_2$ groups may be R groups, (b) an organopolysiloxane containing at least three Si-bonded hydrogen atoms in which the Si-bonded hydrogen atoms are present in an amount of from 0.01 to 1.7 weight percent, (c) a catalyst which promotes the addition of Si-bonded hydrogen atoms to the vinyl groups, and (d) an electrically conductive material.

3. A method for preparing the flexible heating device of claim **1** which comprises applying an adhesive composition to a pair of electrodes which are in contact with a heat resistor and thereafter curing the adhesive composition at an elevated temperature, said adhesive composition consisting essentially of (a) a vinyl containing organopolysiloxane having the formula

$$R_2(CH_2{=}CH)\,SiO\,(R'_2SiO)_n\,SiR_2(CH{=}CH_2)$$

wherein R is selected from the group consisting of methyl and phenyl radicals, R′ is selected from the group consisting of methyl, vinyl and phenyl radicals, *n* is a number sufficient to provide an organopolysiloxane having a viscosity of at least 100,000 cP at 25° C, in which 0.1 to 1 mol percent of the diorganopolysiloxane units are vinylmethylsiloxanes and at least 90 percent of the remaining organic radicals consist of methyl radicals, and some or all of the terminal $CH_2{=}CH$ groups may be R groups, (b) an organopolysiloxane containing at least three Si-bonded hydrogen atoms in which the Si-bonded hydrogen atoms are present in an amount of from 0.01 to 1.7 weight percent, (c) a catalyst which promotes the addition of Si-bonded hydrogen atoms to the vinyl groups, and (d) an electrically conductive material.

4,051,455

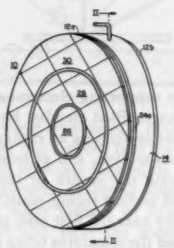
DOUBLE FLEXURE DISC ELECTRO-ACOUSTIC TRANSDUCER

Ralph A. Fowler, Ellicott City, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 20, 1975, Ser. No. 634,003

Int. Cl.[2] *340/10;* **h04b** *13/00*

U.S. Cl. 340—9 **9 Claims**



1. Underwater electro-acoustical transducer apparatus, comprising:

first and second electro-mechanical flexure discs including a radially continuous disc member and a series of concentric electro-mechanical strain translating means affixed to said radially continuous disc member at various radial distances from its center;

annular spacer means for supporting said first and second electro-mechanical flexure discs in parallel spaced relationshp; and

means for selectively energizing the concentric electro-mechanical strain translating means with predetermined alternating current signal frequency spectral components, wherein the upper frequency limit of the frequency spectral components varies in inverse relation to the radical distance of the electro-mechanical strain translating means from the center of the radially continuous disc member.

4,051,456

APPARATUS FOR ESTABLISHING AND MAINTAINING ELECTRIC CONTINUITY IN DRILL PIPE

Joe K. Heilhecker; Everett H. Lock, and Fred H. Deily, all of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Dec. 8, 1975, Ser. No. 638,715

Int. Cl.[2] G01V *1/40*

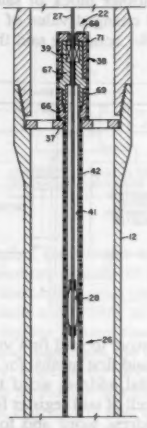
U.S. Cl. 340—18 LD **11 Claims**

1. Apparatus for maintaining electric continuity between a subsurface terminal and a surface terminal within a pipe string which comprises:

an externally insulated conductor tube adapted to be mounted in said pipe string and extending upwardly from said subsurface terminal through a portion, at least, of said pipe string; and

an insulated conductor wire having its lower end disposed within said tube and being in electrical contact with the interior of said tube, said conductor wire extending upwardly from said tube to said surface location, and being telescopically movable with respect to said tube, electric continuity being maintained during telescopic movement.

5. A wellbore telemetry apparatus for a pipe string which includes a subsurface instrument mounted in said drill string and adapted to detect a subsurface condition and generate an electric signal indicative of that condition; and a device for receiving said electric signal, and an electric conductor interconnecting the instrument and the device; the improvement wherein said electric conductor comprises an externally insulated conductor tube extending upwardly from said subsurface instrument through a portion, at least, of said pipe string; an insulated conductor wire mounted in said tube and extending through the upper end of said tube upwardly to the surface said wire being separable at the surface to permit the addition of a pipe section to the pipe string; contact means mounted on the lower end of said wire and providing a movable contact between said wire and the interior of said tube; and means for moving said wire relative to said tube.



10. An electric drilling system which includes a subsurface motor mounted within a drill string and a surface power source, an improved conductor system for maintaining electric continuity as individual pipe sections are added to the drill string, said conductor system comprising:

an externally insulated conductor tube mounted within said drill string and extending through a portion thereof, said tube having a length greater than the length of an individual pipe section;

means for electrically connecting said tube to said motor;

an insulated conductor wire having a lower end disposed within said tube and extending upwardly to the surface;

contact means mounted on said lower end for providing a movable contact on the interior of said tube; and

means for elevating said conductor wire relative to said tube, said movable contact maintaining electric continuity during such movement, thereby permitting additional pipe sections to be added to said drill string.

4,051,457

SYSTEM FOR GENERATING A CHARACTER PATTERN

Fumiyuki Inose, San Jose, Calif.; Kenji Fujikata, Hachioji, and Norio Yokozawa, Fuchi, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 3, 1976, Ser. No. 655,139
Claims priority, application Japan, Feb. 3, 1975, 50-13430
Int. Cl.² G11C *15/00*
U.S. Cl. 340—146.3 MA **9 Claims**

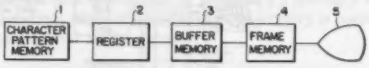
1. A character pattern generating system comprising

a character pattern memory which is made up of a circulating sequential access memory and which stores therein patterns of plural types of characters and information for discriminating character codes corresponding to the character patterns,

register means for temporarily storing a code and a pattern for each of the respective characters sequentially obtained from said character pattern memory,

buffer memory means having stored therein the codes of a plurality of characters to be displayed for receiving and storing the character patterns corresponding to said character codes in the order of the display,

coincidence means for comparing a character code stored in said register means with each of the respective character codes stored in said buffer memory means each time the character code from said character pattern memory is



stored in said register means and for generating a coincidence output upon detecting coincidence therebetween,

storage control means for causing the character pattern of said register means to be stored in said buffer memory means in response to a coincidence output of said coincidence means, and

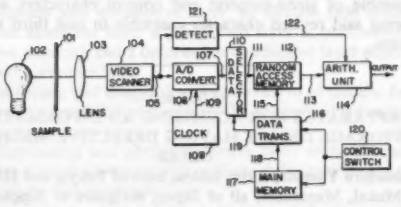
display means for displaying the character patterns of said buffer memory means when the character patterns corresponding to all of said character codes in said buffer memory means have been stored in said buffer memory means.

4,051,458

VIDEO AMPLITUDE RELATED MEASUREMENTS IN IMAGE ANALYSIS

Roger R. Morton, Penfield, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed May 24, 1976, Ser. No. 689,217
Int. Cl.² G06K *9/00*
U.S. Cl. 340—146.3 AG **21 Claims**



1. An image analysis and, optical and detection system for analyzing a field of view to produce optical characteristic data, comprising:

scanning means for line scanning such field of view to produce a video signal having analog values representative of optical characteristic data;

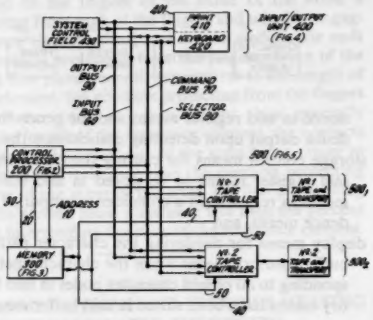
conversion means for converting the video signal analog values corresponding to discrete points along the scan line to discrete digital data having values which are a function of video signal analog values corresponding to such points; and

memory means for storing image analysis optical characteristic data corresponding to digital data including means for automatically compensating for the response characteristics of the optical and detection system and for generating in response to the discrete digital data an output as a function of the stored optical characteristic data corresponding to the received discrete digital data to produce optical characteristic data.

4,051,459
STORED PROGRAM CONTROLLED TYPEWRITING/EDITING SYSTEM

James Joseph Steranko, Weston; Gerardo Rogoff, Chelmsford; Randall Dean Scott, Andover; Angela Frances Gallagher, Framingham, and Peter Burger, West Newton, all of Mass., assignors to Editext Word Processing, Inc., Burlington, Mass.

Filed Jan. 30, 1974, Ser. No. 437,783
Int. Cl.[2] G06F 7/00
U.S. Cl. 364—900 34 Claims



1. In combination in an automated editing system, text supplying means for serially supplying alpha-numeric characters and encoded control characters, first data storage means, a central processor for receiving and assembling said characters serially supplied by said text supplying means, storage means for storing said assembled characters in said first storage means, the improvement comprising means for supplying to said central processor in batched form editing commands for editing the text represented by the characters stored in said storage means, second storage means for storing signals representative of said editing commands, third storage means, and means connected to said storage means and said second and third storage means for operating upon said stored characters and said stored editing commands for generating a revised ensemble of alpha-numeric and control characters and for storing said revised character ensemble in said third storage means.

4,051,460
APPARATUS FOR ACCESSING AN INFORMATION STORAGE DEVICE HAVING DEFECTIVE MEMORY CELLS

Shinichiro Yamada; Akira Ishida, both of Tokyo, and Hisakazu Mukai, Musashino, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Jan. 23, 1976, Ser. No. 651,740
Claims priority, application Japan, Feb. 1, 1975, 50-13660
Int. Cl.[2] G06F 11/00
U.S. Cl. 364—900 2 Claims

1. An information storage device capable of being accessed by a memory utilization means, comprising:

an information storage unit having a given number of memory blocks, each block comprising a plurality of memory cells, one or more of said blocks containing at least one defective cell, each block having a unique address within said memory defined by a digital block address word, each cell being capable of storing a first digital word having an information portion and an address portion identifying the location of said cell within the corresponding block;

a selection control information register having a number of memory cells equal to a desired number of said blocks to be utilized, said desired number being substantially less than said given number,

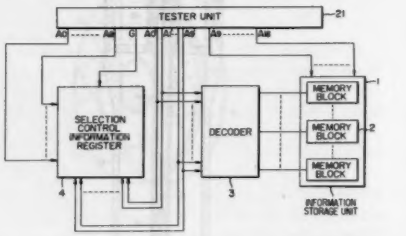
first means for addressing with a second digital address word a selected memory cell of said register to generate a digital block address word in accordance with information in said selected cell;

second means responsive to the value of said digital block address word to address a corresponding selected block of said storage unit;

third means for testing each cell of said selected block and for generating a test signal having a first value indicative of the absence of defective cells therein, and a second value indicative of the presence of defective cells therein;

fourth means responsive to the first value of said test signal for storing said digital block address word in said selection control information register, for identifying the location of said selected block in said storage unit;

fifth means responsive to said second value of said test signal and coupled to said first means, for changing the value of the digital block address word generated by said first means to test another block of said storage unit corresponding to said changed value of said digital block address word and for actuating said third means; and



sixth means responsive to said first value of said test signal and coupled to said first means, for changing the value of said second digital address word to address another selected memory cell of said register for generating a further digital block address word and for actuating said third means to test the corresponding newly selected block of said storage unit,

whereby the cells of selected blocks of said storage unit are sequentially tested, and said third means for testing further including means for entering a digital block address word identifying a corresponding operative block in each memory cell of said register to establish a one-to-one correspondence between each value of said second digital address word the address of said corresponding operative block; and

wherein said memory utilization means comprises means for selectively accessing said information storage unit by providing a desired value of said second digital address word to said register to cause the corresponding digital block address word to address a corresponding operative block of said storage unit.

4,051,461
MANAGEMENT TABLE APPARATUS IN MEMORY HIERARCHY SYSTEM

Masahiro Hashimoto, Sagamihara, and Kenichi Furumaya, Hadano, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 27, 1976, Ser. No. 680,851
Claims priority, application Japan, Apr. 30, 1975, 50-51374
Int. Cl.[2] G06F 11/06, 11/10, 13/00
U.S. Cl. 364—900 3 Claims

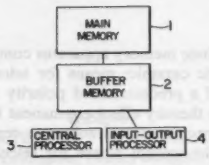
1. A management table apparatus in a memory hierarchy system having a main memory for storing data and a buffer memory consisting of plural memory regions which hold a part of the data stored in said main memory as a copy of said data, said part of data being divided into certain memory units, said management table apparatus comprising:

a managemen tablehaving memory locations corresponding to said memory regions of said buffer memory, said memory locations holding the addresses of the data in said

corresponding memory regions and flags for indicating whether or not the replacement of said data stored in said corresponding memory regions is prohibited;

a searching means for searching said table to check whether or not the data having an address which is demanded by a data processor is stored in said buffer memory by comprising said address demanded by the data processor with addresses stored in respective memory locations of said management table;

a replace control means responsive to the indication of the absence of the demanded data by said searching means for selecting any memory location other than those in which said flags indicate the prohibition of replacement to transfer from said main memory and store in said buffer memory said data having address demanded by the data processor;



a means for demanding the transfer of said demanded data from said main memory directly to said data processor in case where said searching means indicates the absence of said demanded data and where no memory location is selected by said replace control means; and

means for setting said flags upon the detection of a fault in the main memory; a means for stopping the detection of faults in said main memory while the flags corresponding to the data whose existence in said buffer memory is indicated by said searching means, are showing the prohibition of replacement; and

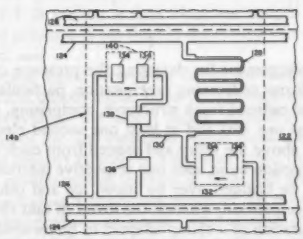
a means for detecting the faults whose number is greater than that of said memory locations of said management table have occurred in said main memory.

4,051,462

COMPUTER MEMORY

Ali Javan, Cambridge, and Charles F. Davis, Jr., Concord, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed July 16, 1975, Ser. No. 596,207
Int. Cl.² G11C *11/02*
U.S. Cl. 340—173 LT **20 Claims**



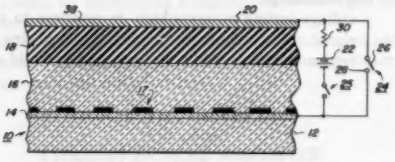
1. In a memory system having an assembly of memory cells with identifying address values, each cell capable of assuming alternatively either of two states, the states defining the value of information stored in the cell, the improvement comprising an array of memory cells spatially arranged on a substrate in accordance with identifying address values, each cell comprising resonant at frequency *f*, an element with a non-linear characteristic, and an antenna structure responsive to incident radiation of frequency *2f*, said non-linear element, antenna structure, and resonant circuitry being connected to form a sub-harmonic oscillator driven by radiation incident on said antenna structure, said oscillator oscillating at frequency f alternatively in two stable states of two distinct phase relations with respect to said radiation of frequency *2f*, said circuitry being arranged and connected so that when said antenna structure is stimulated by optical radiation of frequency *f* having a first of two distinct phase relationships said circuitry is coerced into a first of said stable states and when said antenna structure is stimulated by optical radiation of frequency *f* having a second of two distinct phase relationships said circuitry is coerced into a second of said stable states.

4,051,463

METHOD AND APPARATUS FOR INVERTING THE POLARITY OF AN INPUT IMAGE FORMED ON A SURFACE OF AN IMAGE RECORDING DEVICE

Jan S. Snyder, Upland, Calif., and Clark I. Bright, Kula Kai, Hawaii, assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 21, 1976, Ser. No. 650,826
Int. Cl.² G03G *16/00*
U.S. Cl. 340—173 TP **25 Claims**



1. A method for forming a negative image on a surface of an image recording device, said image comprising information in the form of deformations on said surface, comprising the steps of:

a. providing an image recording device comprising a first conductive layer, a layer of photoconductive material adjacent said conductive layer, an electric field deformable elastomer layer adjacent said layer of photoconductive material, and a deformable conductive layer adjacent said elastomer layer,

b. subjecting said image recording device to an electric field,

c. generating radiation to which the photoconductive layer is responsive,

d. illuminating said photoconductive layer with said radiation whereby substantially uniform deformations are created on said elastomer layer,

e. removing the electric field applied to said image recording device,

f. creating a short-circuited condition between said first conductive layer and said deformable conductive layer,

g. modulating said radiation in accordance with information to be formed on said elastomer layer as deformations, and

h. directing said information modulated radiation to selected areas of said image recording device to create deformations on said elastomer layer which correspond to said selected areas are erased.

4,051,464

SEMICONDUCTOR MEMORY CELL

Jack S. T. Huang, New Hope, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 8, 1975, Ser. No. 611,295
Int. Cl.² G11C *11/40*
U.S. Cl. 340—173 R **8 Claims**

1. A memory cell circuit provided in a semiconductor device having a semiconductor substrate of a first conductivity type except for selected regions thereof including first and second

selected regions, said selected regions having a second conductivity type such that a semiconductor junction is formed between first conductivity portions of said substrate and each of said selected regions including a first semiconductor associated with said first selected region and a second semiconductor junction associated with said second selected region, said semiconductor substrate having first and second major surfaces, said memory cell circuit comprising:

a memory cell including at least a field effect memory transistor comprising:

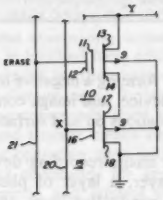
said first selected region which intersects said first major surface,

said second selected region which intersects said first major surfaces and which is spaced apart from said first selected region in said first major surface, and

insulating means disposed on said first major surface with said insulating means having provided therewith a first gate conductive means, said first gate conductive means being located at least in part by that region of said first major surface which is between said first and second selected regions but with said first gate conductive means separated from said first major surface by said insulating means; and

associated memory cell means associated with said memory cell including:

a voltage setting means which, in response to a writing signal, selectively impresses between said first selected region and first conductivity portions of said semiconductor substrate a cell writing voltage of a value to reverse bias said first semiconductor junction, but where also said cell writing voltage is of a value insufficient to cause significant accumulation of charge on said first gate conductive means if solely impressas aforesaid while, concurrently, any significant current is prevented from flowing through said second selected region; and



a voltage setting active device formed at least in part in said substrate which, in response to a select signal being provided thereto to indicate in conjunction with said writing signal that said memory cell has been selected, selectively places said second selected region at a voltage value to effectively forward bias said second semiconductor junction sufficiently to allow charge to accumulate in said first gate conductive means to an extent permitting said field effect memory transistor to be in an "on" condition when said cell writing voltage is concurrently impressed as aforesaid, said voltage setting active device being capable of selectively placing said second selected region at a voltage value as a foresaid when said select signal has a magnitude substantially smaller than that of said writing signal, and said voltage setting active device, in response to said select signal provided thereto indicating said memory cell has not been selected, places said second selected region at a voltage value which provides a reverse bias on said second semiconductor junction.

4,051,465

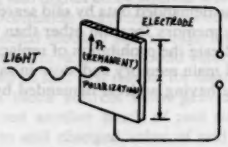
FERROELECTRIC CERAMIC DEVICES

Philip S. Brody, Brookmont, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 411,853, Nov. 1, 1973. This application Dec. 16, 1974, Ser. No. 533,365

Int. Cl.[2] G11C *11/42*

U.S. Cl. 340—173.2 **25 Claims**



1. A photovoltaic memory apparatus comprising: a substrate of a ferroelectric ceramic; means for selectively applying a voltage pulse of a predetermined polarity across a region of said substrate to thereby effect a remanent ferroelectric polarization in said region of said substrate representative of the information to be stored; means for selectively illuminating said poled region of said substrate with a source of radiation, whereby a photovoltaic voltage is produced at said region of a polairy dependent upon said predetermined polarity of said polarizing voltage pulse; and means for detecting said photovoltaic voltage whereby the stored information is retrieved.

4,051,466

ARRANGEMENT FOR DETECTING THE PRESENCE OF SNOW, ICE AND OTHER FREEZING PRECIPITATION, PARTICULARLY ON RAILWAY TRACK STRUCTURES, AND THE LIKE

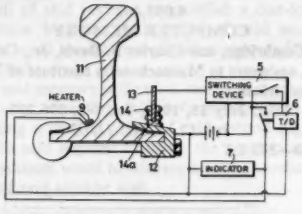
Karl-Heinz Protze, Bickenbach, Germany, assignor to Eltra KG Leicht & Trambauer, Pfungstadt, Germany

Filed July 11, 1975, Ser. No. 595,219

Claims priority, application Germany, July 12, 1974, 2433523

Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—234 **4 Claims**



1. An arrangement for detecting the presence of snow, ice and other forms of freezing precipitation, particularly on road surfaces and railroad track structures, comprising, in combination, at least one first and at least one second electrode positioned one above the other and spaced from each other in the vertical direction by at least one respective interelectrode gap which can be bridged over by snow, ice and other forms of freezing precipitation, wherein the lower of said electrodes has the configuration of a clamp adapted to be secured to the foot portion of a railway track rail and both of said electrodes normally being at ambient temperature; and circuit means electrically connected across said electrodes and operative for detecting the bridging of the interelectrode gap by snow, ice or other forms of freezing precipitation by detecting the interelectrode gap resistance decrease resulting from such bridging of the interelectrode gap, the lower of said electrodes being provided with a sloping run-off surface for effecting the run-off or rain water falling upon said lower electrodes, whereby to

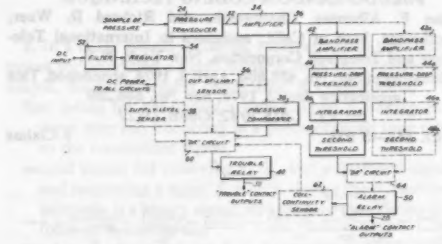
prevent rain water from accumulating within said interelectrode gap and activating said circuit means.

4,051,467

FLUID FLOW DETECTOR FOR A FIRE ALARM SYSTEM

Aaron A. Galvin, Lexington, Mass., assignor to American District Telegraph Company, Jersey City, N.J.

Filed Feb. 5, 1976, Ser. No. 655,436
Int. Cl.² G08B *21/00*
U.S. Cl. 340—239 S **18 Claims**



1. A sprinkler flow detector for providing an alarm signal when a predetermined condition of fluid flow exists in a sprinkler system which includes a system side containing a fluid under pressure, said system side having at least one outlet port for allowing fluid to escape from the system side and at least one inlet port for admitting fluid into the system side, said detector comprising:

a pressure transducer in communication with said system side for providing a first electrical output signal from which pressure of the fluid in the system side can be determined, and

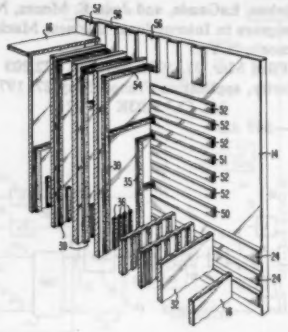
an electrical signal processing circuit for receiving the first electrical output signal from the pressure transducer and for providing the alarm signal whenever the rate of change of the first electrical output signal has a predetermined polarity relative to a predetermined threshold level for a predetermined interval of time, said processing circuit including a band-pass amplifier for providing a second electrical output signal representative of the component of said first output signal within a predetermined frequency range, a threshold detector for producing a third electrical output signal when said second output signal has a predetermined polarity relative to a predetermined threshold level, and means responsive to said third output signal for producing the alarm signal when said third output signal has been produced for a predetermined interval of time.

4,051,468

APPARATUS AND METHOD FOR MODULATING A FLAT PANEL DISPLAY DEVICE

Jan Aleksander Rajchman, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed July 28, 1976, Ser. No. 709,411
Int. Cl.² G06F *3/14*
U.S. Cl. 340—324 M **21 Claims**



1. A system for modulating a display device having a cathodoluminescent screen comprising:

means for sensing an electrical charge on the screen; and

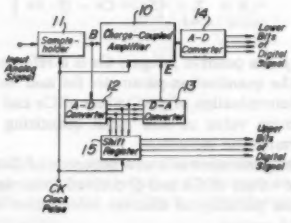
means for regulating the flow of electrons to the screen in response to the sensed charge.

4,051,469

CHARGE-COUPLED AMPLIFIER

Yuichi Ninomiya, Kawasaki, Japan, assignor to Nippon Hoso Kyokai, Tokyo, Japan

Filed Nov. 25, 1975, Ser. No. 635,076
Claims priority, application Japan, Nov. 29, 1974, 49-137229
Int. Cl.² H03K *13/00*
U.S. Cl. 340—347 AD **8 Claims**



8. In combination with a charge-coupled amplifier, an analog to digital converting device comprising:

a sample-holder for storing an input analog signal coupled to the input of said charge-coupled amplifier,

a first analog-to-digital converter coupled to the junction between the output of said sample-holder and the input of said charge-coupled amplifier, said first analog-to-digital converter converting the analog signal at the output of said sample-holder to upper bits of a digital signal,

a digital-to-analog converter coupled to the output of said first analog-to-digital converter and to said charge-coupled amplifier for converting said upper bits to an analog signal and coupling said analog signal to said charge-coupled amplifier, said amplifier delaying the analog signal from the sample-holder and acting as a differential amplifier, and

a second analog-to-digital converter coupled to the output of said charge-coupled amplifier, said second analog-to-

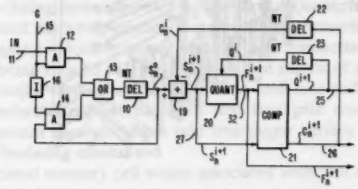
digital converter converting the differential output analog signal at the output of said charge-coupled amplifier to lower bits of said digital signal.

4,051,470

PROCESS FOR BLOCK QUANTIZING AN ELECTRICAL SIGNAL AND DEVICE FOR IMPLEMENTING SAID PROCESS

Daniel J. Esteban, LaGaude, and Jean E. Menez, Nice, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1976, Ser. No. 672,203
Claims priority, application France, May 27, 1975, 75.17189
Int. Cl.[2] H03K *13/22*
U.S. Cl. 340—347 AD **5 Claims**



1. A quantizing process for determining the components of a reference polynomial, a quantization parameter and a sequence of data bits for each section of a signal, each section being defined by a plurality of discrete information signals (S*n*) with each signal being derived from the amplitude taken by said signal at an associated one of N points, said process being characterized by the steps of:

a. determining a sequence of data bits (F*n*) wherein each bit represents a parameter of an associated one of the S*n*'s;

b. determining the means quantization error of said sequence of data bits (F*n*) for sqid signal of N points, said mean quantization error (E) satisfying the expression:

$$E = \sum_{n=1}^{N} \left| Sn - Cn - Q \cdot Fn \right|^{p}$$

in which *p* is a positive integer, *Cn* is a reference polynomial and *Q* is the quantization parameter for said S*n* signals and,

c. the determination of new values of *Cn* and *Q* defining the minimum value of said mean quantizing error *E*, said determination including;

c1. the generation of a new sequence of data bits *Fn* using the values of *Cn* and *Q* derived from step (b) with the same plurality of discrete information signals (*Sn*) of said section;

c2. the generation of a new error E1 by using the newly generated values of *Cn*, *Q* and *Fn*, and

c3. the further repetition of steps (c1) and (c2) until a relatively fixed value of polynomial *Cn* is obtained.

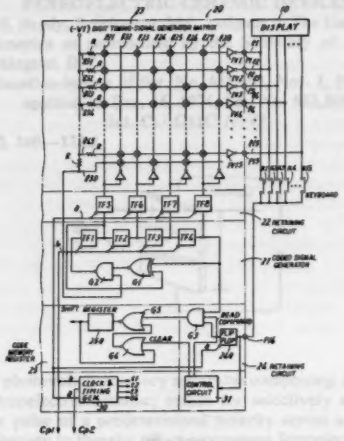
4,051,471

KEY INPUT MEANS PROVIDING COMMON KEY IDENTIFYING AND DISPLAY DRIVING DIGIT TIMING SIGNALS

Isao Hatano, Kyoto; Akira Nagano, Nagaokakyo, and Kazuaki Urasaki, Muko, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Nov. 29, 1974, Ser. No. 528,321
Claims priority, application Japan, Nov. 30, 1973, 48-135565
Int. Cl.[2] G06F *3/02*
U.S. Cl. 340—365 S **23 Claims**

22. A keying input apparatus in accordance with claim **21**, in which said means for changing forcibly a logic state of a predetermined unit comprises means responsive to a logic state of a predetermined unit of said plurality of logic state storing units



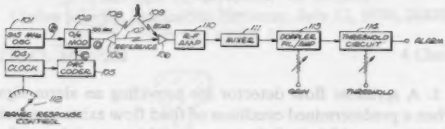
for changing forcibly a logic state of said predetermined unit of said plurality of logic state storing units.

4,051,472

LARGE AREA MOTION SENSOR USING PSEUDO-RANDOM CODING TECHNIQUE

Damian F. Albanese, Chatsworth, and Richard R. Waer, Northridge, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 458,808, April 8, 1974, abandoned. This application Jan. 2, 1976, Ser. No. 646,289
Int. Cl.[2] G01S *9/42*; G08B *13/22*
U.S. Cl. 343—5 PD **8 Claims**



1. A system for detecting a moving intruder entering within a predetermined area of coverage, comprising:

a pair of substantially omni-directional antennas, one for transmitting and the other for receiving, one of said antennas being located at one of the two foci of an ellipse generally defining the boundary of said predetermined area of coverage and the other antenna being located at the other of said foci;

first means for energizing said transmitting antenna with a pseudo-random coded, bi-phase modulated RF carrier;

second means responsive to said receiving antenna for receiving signals including direct radiation from said transmitting antenna and delayed signals corresponding to reflections from objects illuminated by said transmitting antenna;

third means within said second means for autocorrelating said delayed received signals against said direct radiation received signal to produce an autocorrelation output signal having a maximum value when said coded signals reflected from said illuminated objects arrive at said receiving antenna at substantially the same time as the coded signals received by said direct radiation, said autocorrelation output signal decreasing toward zero amplitude as a function of increasing reflected signal delay as the differ-

ential delay between said direct and reflected signals at said receiving antenna approaches one bit duration of said code, thereby to produce a response cut-off perimeter which is along the perimeter of said ellipse substantially bounding said predetermined area.

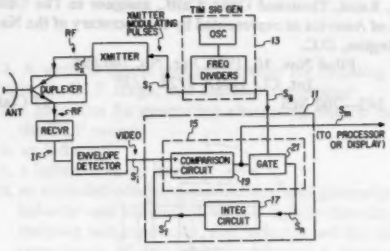
and a Doppler filter responsive to the output of said third means for passing Doppler signals representative of the velocity of corresponding moving objects within said predetermined area.

4,051,473

INPUT TRACKING THRESHOLD DETECTOR

Marvin L. Hooker, Jr., Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 27, 1976, Ser. No. 727,112
Int. Cl.[2] G01S 7/34
U.S. Cl. 343—7 A **14 Claims**



1. In a radar system including receiver means, and detector means for providing a video signal S_f from the receiver means output, the improvement comprising, in combination,

first means for generating a gating signal S_g having enablement intervals occurring in a predetermined time relation to the transmitted signal,

second means for receiving S_f, S_g, and a feedback signal S_h and outputting a signal S_n which, during the S_g enablement intervals, is a binary signal indicative of the relative amplitudes of S_f and S_h, and

third means for receiving S_n and outputting the signal S_h, S_f being indicative of the duty cycle of S_n.

4,051,474

INTERFERENCE REJECTION ANTENNA SYSTEM

Richard B. Mack, Winchester; John A. Strom, Nahnassett, and Anthony Martinez, Westford, all of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 18, 1975, Ser. No. 549,403
Int. Cl.[2] H04B 7/00
U.S. Cl. 343—100 LE **3 Claims**

1. An interference rejection antenna system comprising

at least one antenna radiating lement, each radiating element comprising a vertical dipole and a horizontal dipole disposed in crossed planar relationship,

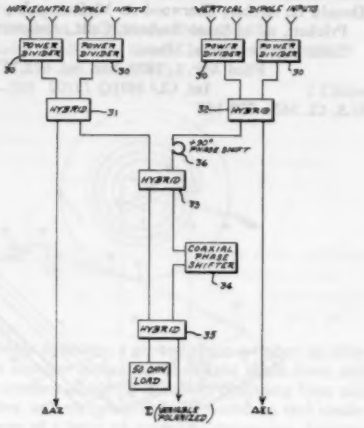
a coaxial feed for each dipole,

a balun connecting each dipole with a coaxial cable feed, each said balun comprising

shorting means connected to provide a quarter wavelength termination extension of a coaxial cable feed,

a quarter wavelength coaxial cable stub is spaced juxtaposition with said quarter wavelength termination extension and terminating on said shorting means, the center conductor of said coaxial cable feed being connected to the outer conductor of said quarter wavelength coaxial stub, and means for connecting dipole segments to the outer conductors of said quarter wavelength termination extension and said quarter wavelength coaxial stub, and

a power dividing network connected to said coaxial cable feeds effective to control the ratio of electromagnetic



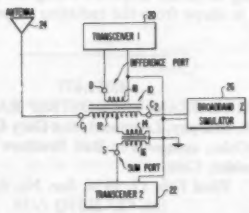
wave energy propagating through vertical and horizontal dipoles.

4,051,475

RADIO RECEIVER ISOLATION SYSTEM

Donn V. Campbell, Eatontown, N.J., assignor to The United States ofAmerica as represented by the Secretary of the Army, Washington, D.C.

Filed July 21, 1976, Ser. No. 707,166
Int. Cl.[2] H04L 5/06
U.S. Cl. 343—180 **10 Claims**



1. A system for permitting simultaneous transmission and reception of two colocated transceivers operating on different frequencies without mutual interference therebetween, comprising in combination:

a single hybrid transformer having a sum port, a difference port, and first and second conjugate ports;

means continuously coupling one of said two transceivers operating at a first frequency to said sum port;

means continuously coupling the other of said two transceivers operating at a second frequency to said difference port;

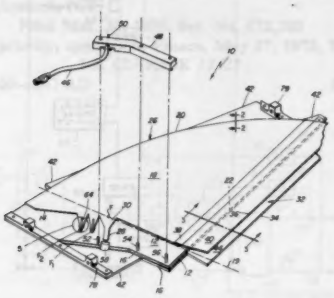
antenna means coupled to said first conjugate port and having first and second predetermined operating impedance characteristics dependent upon the different predetermined operating frequency of each of said two tranceivers; and

electrical load impedance means continuously coupled to said second conjugate port and being operative to substantially simulate said first and second operating impedance characteristics of said antenna means at both of said frequencies simultaneously whereby power coupld to said sum and difference ports at each of said operating frequencies is substantially equally divided between said antenna means and said electrical load impedance means coupled to said two conjugate ports.

4,051,476
PARABOLIC HORN ANTENNA WITH MICROSTRIP FEED

Donald H. Archer; Sherwood A. McOwen, Jr., and Robert J. Prickett, all of Santa Barbara, Calif., assignors to Raytheon Company, Lexington, Mass.

Filed Apr. 1, 1976, Ser. No. 672,707
Int. Cl.[2] H01Q 13/02
U.S. Cl. 343—700 MS 8 Claims

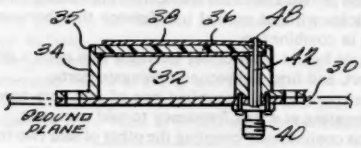


1. An antenna element comprising:
a planar dielectric substrate having a pair of conductive sheets formed on opposite sides thereof to form a parallel plate region having a parabolically shaped edge and a radiating edge;
a conductive material deposited over the parabolically shaped edge to form a parabolically shaped reflecting wall;
a microstrip feed formed on such dielectric substrate, such feed being offset from the reflecting wall and disposed adjacent the focal point of the reflecting wall; and
a radiating structure disposed along the radiating edge and flared in shape from the radiating edge outwardly to free space.

4,051,477
WIDE BEAM MICROSTRIP RADIATOR

Lawrence R. Murphy, Longmont, and Gary G. Sanford, Boulder, both of Colo., assignors to Ball Brothers Research Corporation, Boulder, Colo.

Filed Feb. 17, 1976, Ser. No. 658,534
Int. Cl.[2] H01Q 1/38
U.S. Cl. 343—700 MS 14 Claims

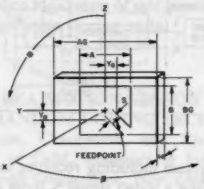


1. A radio frequency antenna structure which produces increased radiation power at low pointing angles near the ground plane without substantially sacrificing radiation efficiency, said structure comprising:
a base electrically conductive reference surface;
a raised pedestal electrically conductive reference surface disposed a predetermined distance above said base reference surface and electrically connected thereto;
dielectric material overlying said raised pedestal reference surface;
an electrically conductive antenna element surface spaced from said raised pedestal reference surface by said dielectric material defining an actual radiating aperture between the periphery of said antenna element surface and said raised pedestal reference surface while at the same time defining an image or virtual radiating aperture of like dimensions disposed below said base reference surface by said predetermined distance, said predetermined distance being related to the intended antenna operating frequency so as to shape the radiated pattern of fields and produce increased radiation power at low pointing angles near the base surface without substantially sacrificing radiation efficiency as compared to the case where said predetermined distance is reduced to zero; and
r.f. feed means electrically connected to said antenna element surface for conducting r.f. energy to/from said antenna element surface.

4,051,478
NOTCHED/DIAGONALLY FED ELECTRIC MICROSTRIP ANTENNA

Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 10, 1976, Ser. No. 740,696
Int. Cl.[2] H01A 9/28, 1/38
U.S. Cl. 343—700 MS 17 Claims



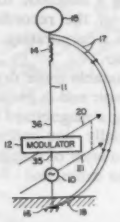
1. A notched/diagonally fed electric microstrip dipole antenna having low physical profile and conformal arraying capability, comprising:
a. a thin ground plane conductor;
b. a thin rectangular radiating element for producing a radiation pattern being spaced from said ground plane;
c. said radiating element being electrically separated from said ground plane by a dielectric substrate;
d. said radiating element having an optimum feed point located along a diagonal line of the element between the outer edge and the center point of said element;
e. said radiating element having a notch extending into said element from the outer edge thereof along said diagonal line of the element to said optimum feed point;
f. the resonant frequency of the antenna being determined, primarily by the length of said radiating element; the width of said notch having a slight effect on the resonant frequency, as the notch width is increased the resonant frequency being increased slightly, and vice versa;
g. the antenna input impedance being variable to match most practical impedances as said feed point is moved along said diagonal line;
h. the antenna bandwidth being variable with the width of the radiating element and the spacing between said radiating element and said ground plane, said spacing between the radiating element and the ground plane having somewhat greater effect on the bandwidth than the element width;
i. said radiating element being operable to oscillate in two modes of current oscillation, each of said two modes being orthogonal to the other;
j. antenna polarization being linear when the radiating element length and width are equal, and the antenna polarization being circular when the phase difference between the two modes of oscillation are in quadrature due to differences between the length and width of the antenna.

4,051,479

ELF VERTICAL DIPOLE ANTENNA SUSPENDED FROM AIRCRAFT

Saul Altshuler, Manhattan Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Mar. 17, 1976, Ser. No. 667,795
Int. Cl.[2] H01Q 1/28, 9/18
U.S. Cl. 343—703 2 Claims



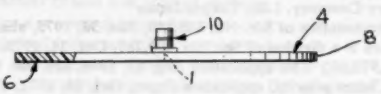
1. A vertical dipole antenna suitable for radiating information in the ELF range, said antenna comprising:
   a. a generator for generating alternating electric currents in the ELF range;
   b. an inductor;
   c. a lighter-than-air craft;
   d. an extended conductor connecting said generator and said inductor and connected to said lighter-than-air craft for carrying said conductor, said inductor and the distributed capacitance of said antenna forming a series resonant circuit;
   e. means for grounding said conductor;
   f. a modulator connected to said conductor and consisting of a saturable reactor;
   g. means controlled by the information for changing at will the inductance of said reactor; and
   h. means for changing the frequency of said generator in unison with the change of inductance provided by said saturable reactor, so that the series resonant circuit of said antenna including the inductance of said reactor will resonate at the instantaneous frequency of said generator, thereby to increase the communication bandwidth of the antenna.

4,051,480

CONFORMAL EDGE-SLOT RADIATORS

Frank Reggia, Bethesda, Md., and Howard S. Jones, Jr., Washington, D.C., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 27, 1976, Ser. No. 736,014
Int. Cl.[2] H01Q 1/28
U.S. Cl. 343—705 8 Claims



1. A dielectric loaded edge-slot radiator whose exterior dimensions can be chosen to allow flush-mounting on cylindrical and conical bodies comprising:
   a dielectric substrate having a plurality of holes uniformly positioned in radial lines over the substrate;
   a conductive plating disposed on the surfaces of the substrate acting as radiating elements;
   a coupling means for exciting the radiating elements, and
   a plurality of inductive shorting posts conformal to the holes in the substrate, whereby the edge-slot radiator can be frequency tuned without changing the physical dimensions of the antenna.

4,051,481

HELICAL BAND ANTENNA

João do Espirito Santo Abreu, Av. Anita Garibaldi, 5147-Curitiba, Parana, Brazil

Filed Feb. 3, 1976, Ser. No. 654,938
Claims priority, application Brazil, Jan. 29, 1975, 7500557
Int. Cl.[2] H01Q 1/36
U.S. Cl. 343—895 2 Claims

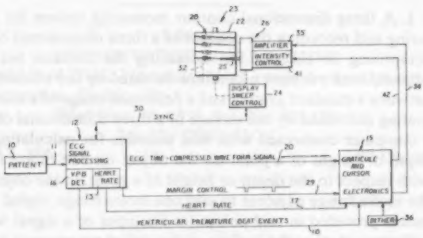
1. In an antenna structure, a ground plane member, an elongated support member extending at a right angle from said ground plane member, stand off insulators extending from said support member, an antenna element mounted on said insulators in the form of a helix of gradually decreasing diameter from said ground plane member, said element having a rectangular cross section having two wide surfaces and two narrow surfaces, and being arranged with its wide surfaces facing in the direction of the axis of the elongated support member.

4,051,482

GRATICULE WITH CURSORS

Richard Paul Andresen, Arlington, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Apr. 26, 1976, Ser. No. 680,016
Int. Cl.[2] A61B 5/04
U.S. Cl. 346—23 12 Claims



1. In a graphical recorded display system for obtaining a record of at least one electrical signal such as one corresponding to at least one vital sign of a patient, a scribing surface medium, scribing means, means for advancing said recording surface medium relative to said scribing means, said scribing means scribing on said scribing surface medium in scribing directions generally transverse to the direction of said advance of said scribing medium relative to said scribing means, means for sensing said at least one of said electrical signal and providing corresponding responsive electrical signals therefor, the improvement comprising:
   means for generating time-incremented electrical signals for extension to said scribing means for scribing a graticule on said scribing surface medium, said graticule being graduated in the direction of said relative advance between said scribing means and said scribing surface medium;
   means for extending said time-incremented electrical signals to said scribing means during a predetermined period for scribing said graticule;
   means providing at least one electrical control signal respectively representative of the value of a respective parameter of a said electrical signal measured during a predeter-

mined period of time, said at least one parameter value control signal having a particular time relationship with said graticule signals determined by said value of said parameter;

means selectively extendible to said scribing means for scribing a cursor on said scribing surface medium; and

means responsive to said at least one parameter value signal for extending said cursor scribing means to said scribing means during said graticule scribing period to scribe a respective cursor on said scribing surface medium in timed relation to said graticule, thereby to indicate the value of said at least one respective parameter.

4,051,483

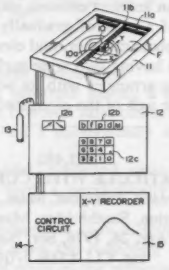
SYSTEM FOR MEASURING AND RECORDING THREE DIMENSIONAL CONFIGURATION OF OBJECT

Masane Suzuki, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Sept. 3, 1976, Ser. No. 720,383

Int. Cl.² G01D *9/00;* **B43L** *13/16;* **G01C** *11/12;* **G01B** *11/30*

U.S. Cl. 346—33 A **2 Claims**



1. A three dimensional contour measuring system for measuring and recording the contour of a three dimensional object comprising an encoder for measuring the distance between adjacent moire fringes of a moire obtained by the interference between a standard grating and a deformed image of a standard grating deformed by the surface of a three dimensional object, a computer connected with said encoder for calculating the depth or height of a point on the object on one moire fringe with respect to the depth or height of a point on the object on the moire fringe adjacent to said one moire fringe, signal input means provided in said computer for input of a signal which indicates whether the surface of the object represented by the moire fringes is convex or concave, magnification input means provided in said computer for input of a signal which indicates the magnification of an optical system for projecting the image of the standard grating on the surface of the object, and an X-Y recorder connected with said computer for recording the output of the computer, whereby said X-Y recorder records the contour of the three dimensional object and said computer computes the cross-sectional area and the cross-sectional line length of the object.

4,051,484

MAGNETIC PRINTER AND METHOD OF PERFORMING SAME

Samuel W. Martin, Martin Road, Weston, Conn. 06880

Filed Nov. 3, 1975, Ser. No. 628,499

Int. Cl.² G03G *19/00*

U.S. Cl. 346—74.1 **31 Claims**

1. A magnetic printer comprising:

A. means for receiving data to be printed;

B. a magnetic recording medium;

C. means for driving said recording medium;

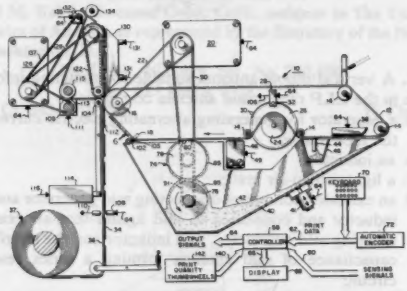
D. means, disposed in operative association with the recording medium for generating a timing signal corresponding to the speed of the medium;

E. writing means disposed in operative association with the recording medium and operating in response to the timing signal of the recording medium speed timing means, for magnetically writing the received data on said recording medium;

F. means, in operative association with the recording medium for applying a magnetic toner to the magnetically written portions of the recording medium, said toner application means incorporating;

1. a toner reservoir,

2. at least one rotatable toner drum communicating with the toner reservoir and in proximity with the recording medium, having a magnetized outer periphery forming a circumferentially non-uniform magnetic field, said field attracting a layer of magnetic toner about the outer periphery of the drum, and



3. at least one magnetizable member positioned between the recording medium and the toner drum for mechanically and magnetically interacting with the toner drum and the toner layer for generating a moving ridge of toner between the magnetizable member and the recording medium corresponding to an induced magnetic field in the magnetizable member by the nonuniform magnetic field on the toner drum, so that the recording medium attracts toner at each magnetically written area along the medium;

G. a data recording material for permanently recording said received data; and

H. transfer means interacting with the data material, and the toner applied portions of the recording medium, for transferring the toner applied to the recording medium to the data recording material.

4,051,485

PRINTING APPARATUS

Kozo Yamada, Hachioji, Japan, assignor to Oki Electric Industry Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 545,740, Jan. 30, 1975, abandoned, which is a division of Ser. No. 409,289, Oct. 24, 1973, Pat. No. 3,972,052. This application Aug. 13, 1976, Ser. No. 714,130

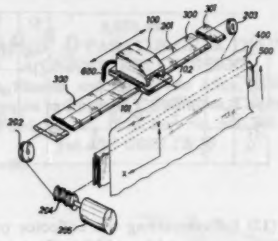
Claims priority, application Japan, Oct. 24, 1972, 47-105834

Int. Cl.² G01D *15/18*

U.S. Cl. 346—75 **7 Claims**

1. For an ink jet printer in which an ink stream is ejected from a nozzle and travels along a path to reach a printing medium, said printer comprising means for splitting said ink stream into ink drops, a charging electrode provided at a position along said path where said ink stream splits into said ink drops, said ink drops passing through said charging electrode, voltage means connected to said electrode for supplying a periodic voltage to said electrode to charge said ink drops, at least a pair of main electrostatic deflection plates located along said path and having a length in the direction of said path at least slightly greater than the distance between sequential ink drops, voltage means for applying a periodic voltage to deflect

at least two of said charged ink drops simultaneously in a main scanning direction, said ink drops passing therethrough in a time period, digital data pulse means representing the pattern figures to be printed connected to said voltage means applied to said charging electrode, means synchronizing said periodic



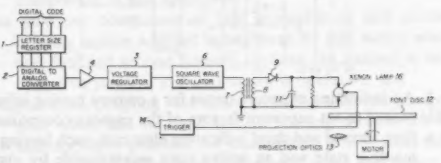
voltage applied to said charging electrode with the time it takes for an ink drop to pass through said main electrostatic deflection plates to provide a printing period during which said ink drops may be charged and a dummy period when said ink drops are prevented from being charged.

4,051,486

DIGITAL FLASH INTENSITY CONTROL SYSTEM FOR PHOTOTYPESETTERS

Peter R. Ebner, South Nashua, and Louis E. Griffith, Hampstead, both of N.H., assignors to Itek Corporation, Lexington, Mass.

Filed Nov. 3, 1975, Ser. No. 628,692
Int. Cl.[2] B41B *13/00*
U.S. Cl. 354—7 **8 Claims**



1. In a phototypesetter:

a. a font storage medium;

b. a light generator for momentarily illuminating selected characters of said font storage medium;

c. a letter size control means for producing a code related to the desired letter size to be typeset; and

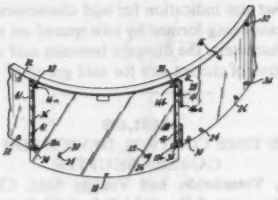
d. light flux generator control means coupled between said letter size control means and said light flux generator for applying a variable flux control signal to said light flux generator proportional to the code produced by said letter size control circuit, said light flux generator control means including an electrical charge generator for producing an electrical charge proportional to the code produced by said letter size control means for controlling the degree of light flux generated by said light flux generator, said charge generator further including an electrical pulse generator for producing an output having energy proportional to said code produced by said letter size control means, together with a storage capacitor coupled to said electrical pulse generator for storing a charge therein proportional to said energy of the output produced by said electrical pulse generator.

4,051,487

FILM FONT FOR PHOTOCOMPOSING APPARATUS

Leonard Storch, New York, N.Y., and George H. Thomas, Dallas, Tex., assignors to Leonard Storch Enterprises, Inc., New York, N.Y.

Filed Feb. 27, 1976, Ser. No. 661,948
Int. Cl.[2] B41B *13/00*
U.S. Cl. 354—12 **5 Claims**



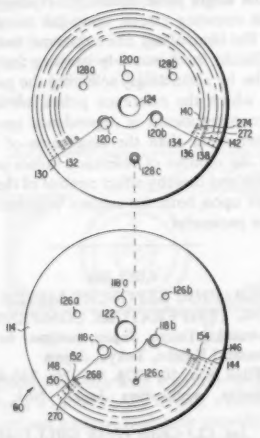
1. A font adapted to be secured to a font carrier having a plurality of font support pins projecting therefrom, said font comprising a piece of film containing characters arranged in desired sequence and having an elongated dimension terminating in first and second lateral edges, at least one area on said film adjacent said first lateral edge adapted to engage at least one of said support pins on said carrier, slide latching means secured to said film at said second lateral edge, said slide latching means including a slide bar mounted for sliding movement in a direction along the surface of said film transverse to said elongated dimension between an open position and a closed position, said slide bar including at least one engagement surface which engages at least one other of said support pins when said slide bar is in its closed position and is removed from said at least one other of said support pins when said slide bar is in its open position so that movement of said slide bar locks said font in position on said carrier.

4,051,488

PHOTOTYPESETTING MACHINE

James Alfred Tidd, Haverhill, Mass., assignor to Alphatype Corporation, Skokie, Ill.

Filed Nov. 12, 1975, Ser. No. 631,419
Int. Cl.[2] G03B *15/16*
U.S. Cl. 354—13 **47 Claims**



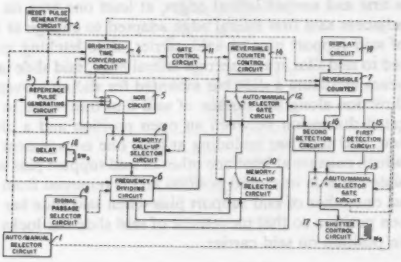
47. A character carrier for a phototypesetting machine comprising a disc bearing light transmitting characters for photographic projection, said characters being arcuately arranged on an opaqu. background, a position mark for each character,

a width indication means for each character positioned between the position mark for that character and a position mark for the next preceding character, said width indication means operating to provide character width information and including two spaced marks for each character, the distance between said two marks being indicative of character width, said position marks and width indication means being arranged concentrically with said characters, and set size indicator means for providing a set size indication for said characters, said set size indicator means being formed by two spaced set size marks for a group of characters, the distance between said set size marks being indicative of the set size for said group of characters.

4,051,489
EXPOSURE TIME CONTROL DEVICE FOR ELECTRIC CAMERA SHUTTER

Takeo Saito, Yotsukaido, and Youichi Seki, Chiba, both of Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed May 15, 1975, Ser. No. 577,768
Claims priority, application Japan, May 16, 1974, 49-54909
Int. Cl.² G03B 7/08
U.S. Cl. 354—23 D **3 Claims**



1. In an exposure time control device of an electric camera shutter: means including a brightness/time conversion circuit for developing a single pulse having a width representative of the brightness of a subject to be photographed; a reference pulse generating circuit for generating reference pulses at a constant rate; multi-stage counting means responsive to the single pulse and the reference pulses applied to a selected one of its counting stages for counting reference pulses during the duration of the single pulse; means for reading-out the count stored in said counting circuit upon the termination of said single pulse for controlling the exposure time of a camera shutter; and means for selectively varying the pulse width of the single pulse by accordingly selecting the particular counting stage to which the reference pulses are applied to said multi-stage counting means in dependence upon an exposure time parameter other than the brightness of the subject to thereby vary the number of reference pulses counted by said counting means and thereby effect control of the exposure time in dependence upon both the subject brightness and another exposure time parameter.

4,051,490
PHOTOGRAPHIC EXPOSURE METER CIRCUIT HAVING TEMPERATURE COMPENSATION

Masahiro Kawasaki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

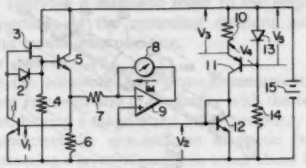
Filed Nov. 10, 1976, Ser. No. 740,464
Claims priority, application Japan, Nov. 12, 1975, 50-153834[U]
Int. Cl.² G03B 17/18; G01J 1/44
U.S. Cl. 354—24 **4 Claims**

1. In a temperature compensating photographic exposure meter circuit including means incorporating a photo sensitive element for producing a first logarithmically compressed voltage proportional to the apex value of the brightness of a photographic object, the improvement characterized by:

a. a transistor (11),

b. a resistor (10) connected to the emitter of said transistor,

c. a light emitting diode (13) having its cathode connected to the base of said transistor,



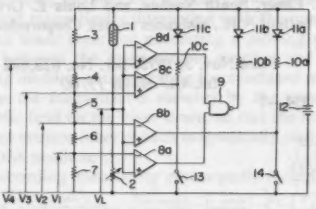
d. means (12) for converting the collector output of said transistor into a second logarithmically compressed voltage, and

e. meter indication means responsive to the difference between said first and second logarithmically compressed voltages.

4,051,491
INDICATING EXPOSURE METER FOR A CAMERA

Kenji Toyoda, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 26, 1975, Ser. No. 635,440
Claims priority, application Japan, Dec. 3, 1974, 49-137691
Int. Cl.² G03B 17/20, 7/00
U.S. Cl. 354—60 L **2 Claims**



1. An indicating exposure meter for a camera having adjustable means to set exposure factors of the camera comprising:

a. first, second and third indicating elements, each having an inactive state and an active state ascertainable by visual inspection;

b. a photoelectric element for receiving light from an object to be photographed;

c. control means connected with said photoelectric element and with said adjustable means for producing a proper exposure signal when the combination of the intensity of the light from the object and the exposure factors provides a proper exposure, an over-exposure signal when the combination provides an over-exposure and an under-exposure signal when the combination provides an under-exposure, said first indicating element having an active state produced in response to the over-exposure signal, said second indicating element having an active state produced in response to the under-exposure signal and said third indicating element having an active state produced in response to the proper exposure signal; and

d. switch means associated with said first indicating element and with said adjustable means, said switch means being normally in a first state and being placed in a second state in response to adjustment of said adjustable means so as to obtain a proper exposure for a light intensity lower than the lower limit of the light measuring range of said photoelectric element for rendering said first indicating element active irrespective of signals from said control means,

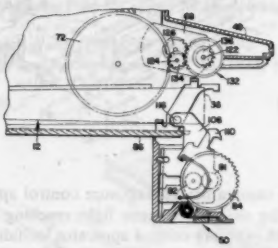
whereby both the active state of said second indicating element due to said under-exposure signal and the active state of said first indicating element due to the second state of said switch means indicate that said light intensity is lower than the lower limit of the light measuring range of said photoelectric element.

4,051,492

PHOTOGRAPHIC APPARATUS GEAR TRAIN HAVING A UNIQUE SET OF GEARS

Irving Laskin, Sharon, and David Van Allen, Malden, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 13, 1976, Ser. No. 648,765
Int. Cl.[2] G03B *17/50*
U.S. Cl. 354—86 **20 Claims**



1. Photographic apparatus having at least one motor driven component, said apparatus comprising:

a housing including first and second housing sections interconnected for movement between an operative position wherein said first and second sections are in operative alignment and an inoperative position wherein said first and second sections are spaced apart and are not operatively aligned;

a motor in said first housing section for driving at least one component of said apparatus;

at least one component of said apparatus on said second housing section adapted to be driven by said motor when said first and second housing sections are located in said operative position and said motor is operative; and

a gear train, coupling said motor to said at least one component when said first and second housing sections are in said operative position, for transmitting power from said motor to said at least one component, when said motor is operative;

said gear train including at least one pinion mounted on one of said first and second housing sections and at least one gear mounted on the other of said first and second sections, said pinion and gear being configured to be engaged in operative mesh when said first and second housing sections are located in said operative position and to be disengaged from each other when said first and second housing sections are located in said inoperative position;

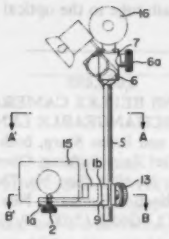
said pinion and gear having respective tooth profiles whereby the addendums said pinion and gear are unequal, said pinion teeth having a shorter addendum than said teeth on said gear, said respective tooth profile being configured for conjugate action based on involute curves, and said respective tooth profiles also being configured such that tip spacing, as measured between the midpoints of radial end tips of adjacent teeth on said pinion and said gear, is substantially equal for facilitating bringing said pinion and gear into operative mesh when said first and second housing sections are moved from said inoperative position to said operative position.

4,051,493

FLASH PHOTOGRAPHING DEVICE

Sadao Nakagawa, Yokohama; Masaaki Tsukamoto, and Toshio Dobashi, both of Kawasaki, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jan. 16, 1976, Ser. No. 649,636
Claims priority, application Japan, Jan. 23, 1975, 50-10086
Int. Cl.[2] G03B *15/03*
U.S. Cl. 354—126 **9 Claims**



1. A flash photographing device adapted to be attached to a camera body and a flash gun for illuminating an object to be photographed, said device comprising:

a. a rod member for supporting said flash gun;

b. a supporting member secured to said camera body;

c. holder means displaceable between a restraining position in which said holder means holds said rod member against sliding and rotating movement and a half-restraining position in which said holder means holds said rod member for at least sliding movement upon application of an extraneous force on said rod member, said holder means being rotatable about said supporting member;

d. adjusting means provided on said supporting member for displacing said holder means between said restraining position and said half-restraining position; and

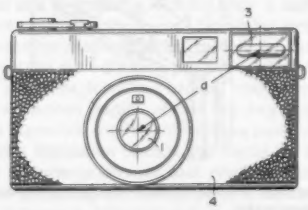
e. restraining means provided to restrain said holder means from rotating when said holder means is in said restraining position and to release the restraint when said holder means is in said half-restraining position.

4,051,494

PHOTOGRAPHIC CAMERA WITH BUILT-IN STROBO FLASH LIGHT DEVICE

Yoshihiro Fujita; Ikuo Fuutagawa, and Katsuji Muramatsu, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sept. 12, 1975, Ser. No. 612,947
Claims priority, application Japan, Sept. 13, 1974, 49-105573
Int. Cl.[2] G03B *15/03*
U.S. Cl. 354—145 **2 Claims**



1. A photographic camera with a built-in strobo flash light device comprising a camera body having a taking lens on the front face thereof and a strobo flash tube provided on the front face of the camera body wherein in order to minimize the occurrence of a so-called "red-eye phenomenon" the distance from the center of the strobo flash tube to the optical axis of the

taking lens is within the range of 4.5cm to 6.5cm, and that the guide number of the strobo flash tube is selected to satisty the following formula;

$$GN < \frac{1}{0.37 - 0.73\,(\tan^{-1}\frac{d}{400}/2.5^{\circ})}$$

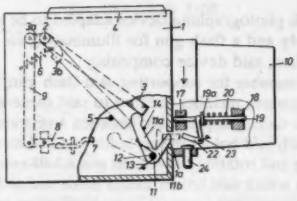
where GN is the guide number and *d* is the distance from the center of the strobo flash tube to the optical axis of the taking lens.

4,051,495

SINGLE LENS REFLEX CAMERA WITH INTERCHANGEABLE LENS

Waldemar Rentschler, and Franz Starp, both of Wildbad, Germany, assignors to Carl Zeiss Stiftung, Oberkochen, Germany

Filed Oct. 29, 1976, Ser. No. 736,706
Claims priority, application Germany, Nov. 4, 1975, 2549287
Int. Cl.² G03B *17/00, 19/12*
U.S. Cl. 354—152 **12 Claims**



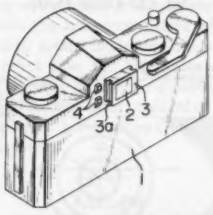
1. A single lens reflex camera of the type having a mirror movable to and from a normal reflecting position in which the mirror reflects an image of a scene onto a viewfinder screen and having an interchangeable lens detachable from the camera and attachable thereto in a definite functional operative position, characterized by the provision of means for blurring said image on said screen if an interchangeable lens is not attached in said definite operative position.

4,051,496

REMOTE CONTROL CAMERA

Yozo Iida, Komae; Shigeo Akasaka, Kodaira, and Yasuhito Kawahara, Tokyo, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Feb. 2, 1976, Ser. No. 654,333
Claims priority, application Japan, Feb. 12, 1975, 50-18566[U]
Int. Cl.² G03B *13/02*
U.S. Cl. 354—219 **2 Claims**



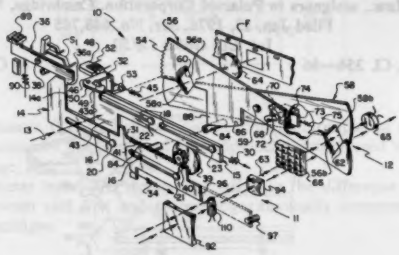
1. A remote control camera which comprises:
a camera body;
an eye-piece associated with said camera body; and
means for mounting and dismounting a signal receiving device which actuates the camera upon receipt of a remote control signal, said mounting and dismounting means being provided at an appropriate position on said camera body so that the body of said signal receiving device may be mounted at a position where it entirely covers said eye-piece of the camera to prevent any undesirable light from entering into the camera body through the eye-piece, said signal receiving device having engaging means corresponding to said mounting and dismounting means.

4,051,497

PROGRAMMED EXPOSURE CONTROL APPARATUS

Donald Malcolm Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 28, 1976, Ser. No. 653,065
Int. Cl.² G03B *9/00, 7/14*
U.S. Cl. 354—231 **2 Claims**



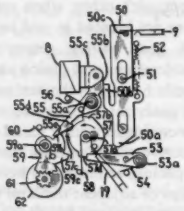
1. In a camera having exposure control apparatus for controlling the amount of scene light reaching a film exposure plane, said exposure control apparatus including (1) a variable speed shutter having at least one light regulating member movable for varying an exposure interval, and (2) a diaphragm for defining an exposure aperture of variable size, said exposure control apparatus being of the type in which the duration of the exposure interval is proportional to the size of the exposure aperture to effect a compromise between shutter speed and depth of field, the improvement comprising:
control means for actuating said light regulating member and said diaphragm to establish an exposure interval and an exposure aperture prior to an exposure, said control means further defining means for setting said diaphragm in an exposure aperture defining position in synchronism with actuating said shutter to initiate an exposure independent of the particular combination of aperture size and shutter speed employed to effect an exposure.

4,051,498

CAMERA ELECTRIC SHUTTER WITH MECHANICAL DELAY DEVICE

Kiyoshi Kitai, Tokyo, Japan, assignor to Seiko Koki Kabushiki Kaisha, Japan

Division of Ser. No. 317,709, Dec. 21, 1972, Pat. No. 3,829,877, which is a continuation of Ser. No. 97,512, Dec. 14, 1970, abandoned. This application Aug. 2, 1974, Ser. No. 494,374
Claims priority, application Japan, Dec. 16, 1969, 44-100815
Int. Cl.² G03B *9/58, 17/40*
U.S. Cl. 354—234 **3 Claims**



1. In an electric shutter having a lense aperture, sector means operable to a position for opening the lens aperture and a

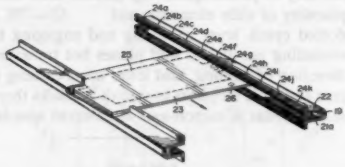
position for closing the lens aperture, operating means to operate the sector means to the position opening the lens aperture and the position closing the lens aperture, control means to render the operating means effective to operate the sector means to open the lens aperture including automatic timing means to determine a delay period after which the sector means closes the shutter lens aperture, said timing means comprising an electromagnet, normally controlling said delay period, and including mechanical delay means normally rendered ineffective by said electromagnet and rendered effective by said electromagnet for effecting a delayed closing of the shutter lens aperture only when the electromagnet is insufficiently energized or completely deenergized.

4,051,499

LINEAR MOTOR-DRIVEN FOCAL PLANE SHUTTER

Toshihiro Kondo, Chofu, Japan, assignor to Toshihiro Kondo, Chofu and Fuji Photo Film Co., Ltd., Minami-ashigara, both of Japan

Filed Apr. 15, 1976, Ser. No. 677,392
Claims priority, application Japan, Apr. 18, 1975, 50-47867
Int. Cl.² G03B 9/42
U.S. Cl. 354—234 **18 Claims**



1. A linear motor-driven focal plane shutter for a camera comprising in combination:

a flat shutter blind slidable back and forth along a fixed path to open and close the film aperture in the camera,

a flat permanent magnet sealed within the shutter blind along a plane approximately bisecting the thickness thereof,

a series of electromagnetic coils arranged in a line in the direction of travel of the shutter blind, said electromagnetic coils being situated along the path followed by a pole of the permanent magnet of the shutter blind,

means for sequentially energizing the electromagnetic coils to cause the shutter blind in which the associated permanent magnet is sealed to run in the direction in which the electromagnetic coils are energized in accordance with the principle of a linear motor,

a shutter control circuit for sequentially energizing the series of electromagnetic coils.

10. A linear motor-driven focal plane shutter for a camera comprising in combination:

a leading blind movable back and forth along a fixed path to open and close the film aperture in the camera,

a trailing blind movable back and forth along a fixed path to close and open the film aperture in the camera,

a first permanent magnet sealed within the leading blind along a plane approximately bisecting the thickness thereof,

a second permanent magnet sealed within the trailing blind along a plane approximately bisecting the thickness thereof,

at least two series of electromagnetic coils arranged in lines in the direction of travel of the leading blind and the trailing blind, each series of electromagnetic coils being situated along the path followed by a pole of the permanent magnet of the associated blind,

means for sequentially energizing the electromagnetic coils in each series to cause the associated permanent magnet and the blind in which it is sealed to run in the direction in which the electromagnetic coils are energized in accordance with the principle of a linear motor,

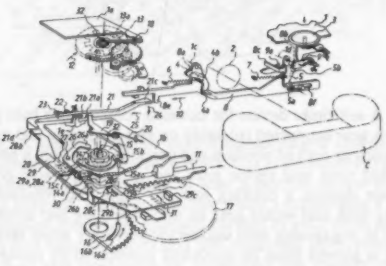
a shutter control circuit for first sequentially energizing the series of electromagnetic coils associated with the leading blind and then after the lapse of a period of time corresponding to the shutter speed sequentially energizing the series of electromagnetic coils associated with the trailing blind.

4,051,500

PHOTOGRAPHIC CAMERA WITH A TIME-DELAY MECHANISM

Dieter Maas, Poring, and Gerda Linke, Munich, both of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 4, 1975, Ser. No. 628,822
Claims priority, application Germany, Nov. 16, 1974, 2454509
Int. Cl.² G03B 9/64
U.S. Cl. 354—239 **6 Claims**



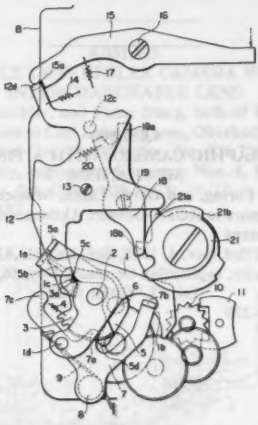
4. In a photographic camera of the type having a shutter and a shutter setting and releasing mechanism including an operating member mounted in the camera for translation in a straight path and in a predetermined direction upon release, a combination comprising an elongated coupling element having a first, second and third portion longitudinally spaced from one another, the latter having an inclined surface; means for mounting said coupling component in the camera for pivoting between a first and a second position in which said first portion is located without and within said path, respectively, and also for limited joint translation with the operating member upon engagement of said first portion with the latter in said second position of said coupling component; a time-delay mechanism; an arresting member mounted in the camera for movement between an arresting and a releasing position in which it arrests and releases said time-delay mechanism, respectively, and engaged by said second portion of said coupling component for movement therewith toward said releasing position during said limited joint translation thereof; and means for pivoting said coupling component between said positions thereof, including at least one sliding member mounted in the camera for displacement between a retracted and an extended position upon release by said time-delay mechanism and having a projection which engages said inclined surface of said third portion during the displacement of said sliding member toward said extended position thereof to pivot said coupling component toward said first position, and an actuating element accessible from the exterior of the camera and operatively connected to said sliding member for displacing the same between said positions thereof.

4,051,501

BUILT-IN SELF-TIMER FOR CAMERAS

Nobuyoshi Inoue, Kawagoe, and Toshihisa Saito, Tokyo, both of Japan, assignors to Copal Company Limited, Japan

Filed June 28, 1976, Ser. No. 700,183
Claims priority, application Japan, June 26, 1975, 50-90368; Dec. 22, 1975, 50-173845
Int. Cl.² G03B 9/64
U.S. Cl. 354—239 2 Claims



1. A self-timer device for cameras comprising a base plate, a sector gear supported rotatably on said base plate and movable between its cocked position and uncocked position, a gear train meshed with said sector gear and including a star gear and anchor therein, a cocking member supported rotatably relatively with said sector gear on said base plate and arranged so as to be engageable with said sector gear only when said sector gear is moved from its uncocked position to its cocked position, a checking member supported rotarably on said base plate and engageable with said star gear to stop the operation of said gear train, a locking member supported rotatably on said base plate and engaged with said cocking member and checking member, and an interlocking member supported rotatably on said base plate and arranged so as to engage with said locking member and checking member, said locking member being adapted to be movable to a position of not engaging with said interlocking member through said cocking member even after said sector gear is moved to the cocked position.

4,051,502

MULTIPLE ELEMENT FOCAL PLANE SHUTTER FOR PHOTOGRAPHIC CAMERAS

Bodo Mielke, Wolfenbuttel, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

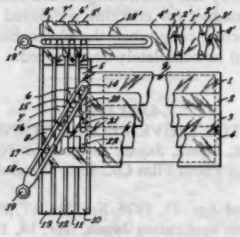
Filed Nov. 10, 1975, Ser. No. 630,341
Claims priority, application Germany, Dec. 20, 1974, 2460442
Int. Cl.² G03B 9/38
U.S. Cl. 354—249 9 Claims

1. In a focal plane shutter for photographic cameras having two shutter means respectively for colinearly moving across an image aperture in the camera, thereby respectively providing for opening and closing functions depending on the direction of movement and whereby one of the shutter means provides for opening movement for film exposure, while the other one of the shutter means provides for a delayed closing movement, each of the shutter means comprising:

a plurality of lamellas including an exposure slit defining lamella, each of said lamellas extending for the entire width of the image aperture, the lamellas each providing for movement in planes respectively parallel to the plane of the aperture, the planes being spaced transversely to this parallel extension so that each lamella can move independently from the others;

a plurality of slide elements respectively connected to or being a part of the lamella of the plurality of lamellas and being laterally offset in relation to each other;

means defining a plurality of straight, parallel slide paths and respectively receiving for guiding each of said slide elements, so that said slide elements move in said paths parallel to each other and to the direction of movement of said lamellas;



a plurality of pins respectively on said slide elements of the plurality of slide elements; and

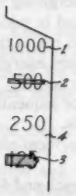
a slotted crank lever receiving and engaging the pins and extending parallel to said planes but transversely to said direction of guiding, said lever upon turning moving said pins and slide elements in said slide tracks thereby moving said lamellas in unison and at different speeds.

4,051,503

EXPOSURE DISPLAY DEVICE FOR A SINGLE LENS REFLEX CAMERA

Nayuki Uno, Urawa; Tetsuji Shono, Ranzan; Fumio Urano, Omiya; Masahiro Kawasaki, and Katsuhiko Miyata, both of Saitama, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 12, 1975, Ser. No. 612,945
Claims priority, application Japan, Sept. 30, 1974, 49-118012[U]
Int. Cl.² G03B 17/00, 17/20
U.S. Cl. 354—289 10 Claims



1. A digital type exposure display device for a single lens reflex camera comprising:

a nominal value display including a transparent support member and a series of nominal values marked thereon, each of said nominal values being related to an exposure component of a photography system;

a first set of selectively energizable light display elements at least equal in number to the number of nominal values marked on said transparent support, each of said light display elements having an optical characteristic that changes when a suitable voltage is applied to said light display element, said first set of selectively energizable light display elements and said transparent support being superimposed such that one of said first set of selectively energizable light display elements is associated with each

of said nominal values so that the selective energization of one of said first set of selectively energizable light display elements causes a first display of a related one of said nominal values; and,

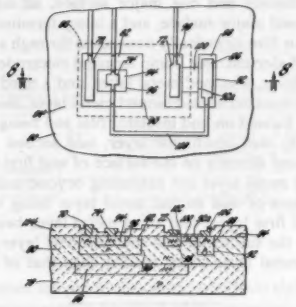
a second set of selectively energizable light display elements at least equal in number to the number of nominal values marked on said transparent support, each of said light display elements having an optical characteristic that changes when a suitable voltage is applied to said light display element, said second set of selectively energizable light display elements and said first set of selectively energizable light display elements being superimposed such that one element on said second set of selectively energizable light display elements is associated with each of said nominal values so that the selective energization of one of said second set of selectively energizable light display elements causes a second display of a related one of said nomilnal values.

4,051,504

ION IMPLANTED ZENER DIODE

John W. Hile, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 14, 1975, Ser. No. 622,081
Int. Cl.[2] H01L *29/90*
U.S. Cl. 357—13 **4 Claims**



1. A zener diode having an accurately predetermined breakdown voltage comprising:

a body of semiconductive material having at least a portion of one conductivity type intersecting a surface of said body;

a minimum electrical resistivity in said portion of not less than about 10 ohm-centimeter;

a first island-like region of opposite conductivity type semiconductive material inset within said portion and intersecting said surface;

said first region having a first predetermined concentration of conductivity determining impurity of said opposite type adjacent said surface that is in excess of 1×10^{19} atoms per cubic centimeter of semiconductive material;

said first region and said portion forming a PN junction that has a breakdown voltage in excess of a predetermined voltage;

a second region of more conductive one conductivity type within said portion and intersecting said surface, said second region being contiguous said first region and containing an accurately predetermined number of implanted one conductivity type impurity atoms in addition to one conductivity type impurity atoms determining said resistivity of said portion;

said additional impurity atoms implanted in said secnd region having an accurately predetermined second concentration that is at least two orders of magnitude less than said first predetermined concentration and is within the range of 1×10^{16} to 1×10^{19} atoms per cubic centimeter of semiconductive material contiguous said first region;

a PN junction between said first and second regions having an accurately predetermined breakdown voltage imparted by said predetermined concentrations that is lower than the breakdown voltage of the PN junction between said first region and said portion; and

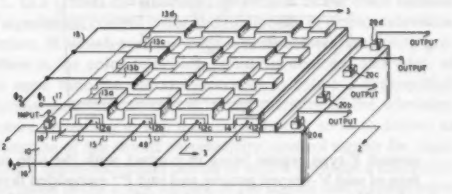
discrete low resistance electrical connections to said first and regions providing a zener diode having an accurately predetermined breakdown voltage.

4,051,505

TWO-DIMENSIONAL TRANSFER IN CHARGE TRANSFER DEVICE

Robert Harold Krambeck, South Plainfield; Carlo Heinrich Sequin, Summit, and Robert Henry Walden, Warren, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 16, 1973, Ser. No. 342,173
Int. Cl.[2] H01L *29/78*
U.S. Cl. 357—24 **11 Claims**



1. A charge transfer device comprising a charge storage medium the bulk of which is of a first conductivity type, a first insulating layer covering at least a portion of one surface of said medium, a first conductive pattern comprising a series of elongated electrodes disposed parallel to each other extending in a first direction upon said first insulating layer, means under each of said electrodes for preventing the transfer of mobile charge in the medium in said first direction under said electrodes, a second insulating layer overlying said first conductive pattern, a second conductive pattern comprising a series of elongated electrodes disposed over said second insulating layer parallel to each other extending in a second direction which is noncollinear with said first direction, each of said electrodes overlying the first conductive pattern at certain areas and overlying said storage medium in the area between said first conductive pattern, the electrodes of said second conductive pattern defining transfer paths for movement of mobile charge carriers in the medium in said first direction in the spaces between the electrodes of the first conductive pattern extending substantially the length of the electrodes of the first conductive pattern and the electrodes of the first conductive pattern defining transfer paths in the medium in said second direction extending substantially the length of the electrodes of said second conductive pattern, and means for sequentially biasing a series of electrodes of one of said conductive patterns to transfer charge carriers in one of said noncollinear directions while biasing the other conductive pattern so as to form blocking potentials to movement of charge carriers in the other of said noncollinear directions.

4,051,506

COMPLEMENTARY SEMICONDUCTOR DEVICE

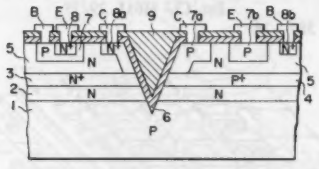
Noboru Horie, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed May 25, 1976, Ser. No. 689,819
Claims priority, application Japan, May 28, 1975, 50-62862
Int. Cl.[2] H01L *29/06, 27/12, 29/34, 27/02*
U.S. Cl. 357—55 **11 Claims**

1. A complementary semiconductor device comprising

a. a *p*-type Si substrate;

b. a first N-type epitaxial layer formed through epitaxial growth on said P-type Si substrate;
c. N+ and P+ embedded layers formed in said first N-type epitaxial layer through diffusion using a mask;
d. a second N-type epitaxial layer formed on said first N-type epitaxial layer including both said embedded layers;
e. a V-shaped groove dividing into two parts said first epitaxial layer, said second epitaxial layer and separating said N+ and P+ embedded layers from each other;
f. a SiO_2 film formed on the surface of said second N-type epitaxial layer including said V-shaped groove;
g. a first, second and third P-type regions formed in said second N-type epitaxial layer by using said SiO_2 film as a diffusion mask, with their surfaces exposed, said first P-type region being formed in the left side part of said second epitaxial region divided by said V-shaped groove, said second and third P-type regions being formed in the right side part of said second epitaxial region and said



second P-type region being in contact with the side surface of said V-shaped groove and said P+ embedded layer;
h. a first N+ region formed in said first P-type region with its surface exposed, a second N+ region formed in the left side part of said second epitaxial layer with its surface exposed and in contact with the side surface of said V-shaped groove and said N+ embedded layer, and a third N+ region formed in the right side part of said second epitaxial layer with the surface exposed;
i. an organic insulating material filling said V-shaped groove with said SiO_2 film disposed underneath, the surface of said organic insulating material being flat; and
j. a first base electrode attached to said first P-type region, a first emitter electrode attached to said first N+ region, a first collector electrode attached to said second N+ region, a second collector electrode attached to said second P-type region, a second emitter electrode attached to said third P-type region and a second base electrode attached to said third N+ regions.

4,051,507

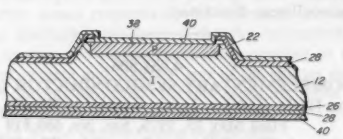
SEMICONDUCTOR STRUCTURES

Warren C. Rosvold, Sunnyvale, Calif., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 524,723, Nov. 18, 1974, abandoned, which is a continuation of Ser. No. 255,284, May 19, 1972, abandoned, which is a division of Ser. No. 86,960, Nov. 4, 1970, which is a continuation of Ser. No. 795,977, Feb. 3, 1969, abandoned. This application May 11, 1976, Ser. No. 685,204

Int. Cl.² H01L *29/04, 29/06, 29/12, 23/48*

U.S. Cl. 357—60 **5 Claims**



1. A semiconductor device comprising:
a semiconductor body having a region of different conductivity type layers with surfaces of such layers lying in the <100> crystallographic plane of the semiconductor body;
such region having wall portions with sides parallel to the <111> crystallographic plane of the semiconductor body;
such wall portions being disposed along at least a portion of the periphery of the device.

4,051,508

SEMICONDUCTOR DEVICE HAVING MULTISTEPPED BUMP TERMINAL ELECTRODES

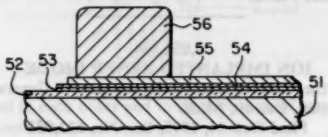
Susumu Sato, and Hideo Tsunemitsu, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed June 9, 1976, Ser. No. 694,358

Claims priority, application Japan, June 13, 1975, 50-71748

Int. Cl.² H01L *23/48, 29/46, 29/54*

U.S. Cl. 357—71 **8 Claims**



1. A semiconductor device having an improved bump terminal electrode comprising a semiconductor substrate having at least one element and one major surface, an insulator film formed on said major surface, and a bump terminal formed on said insulator film electrically connected through a conductive layer to said element, said bump terminal electrode including a first metal layer, a second metal layer, and a third metal layer of the same material as said second metal layer, said first metal layer being formed on said insulator film and being electrically connected to said conductor layer, said second metal layer being disposed directly on the surface of said first metal layer, said second metal layer not extending beyond said first metal layer, the area of said second metal layer being smaller than that of said first layer, said third metal layer being disposed directly on the surface of said second metal layer, the area of said third metal layer being smaller than that of said second metal layer.

4,051,509

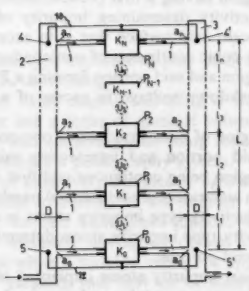
APPARATUS FOR COOLING ELECTRICAL DEVICES AT DIFFERENT ELECTRICAL POTENTIALS BY MEANS OF A FLOWING MEDIUM

Conrad Beriger, Aarau, and Eduard Keller, Wettingen, both of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Feb. 5, 1976, Ser. No. 655,558

Int. Cl.² H01L *25/04, 23/02*

U.S. Cl. 357—82 **5 Claims**



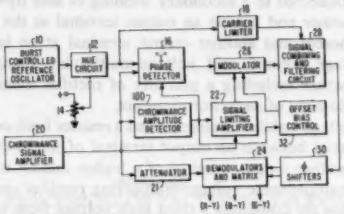
1. An apparatus for cooling electrical devices at different

electrical potentials by means of a flowing cooling medium and for preventing corrosion thereof, comprising a plurality of electrically conductive devices at different electrical potentials, means for circulating a cooling agent for cooling the electrically conductive devices, control electrodes in contact with the cooling agent, means for connecting the control electrodes with predetermined ones of said electrically conductive devices such that the greatest potential difference between the electrically conductive devices drops at the control electrodes to avoid corrosion effects at the electrically conductive devices, said control electrodes essentially possessing the same potential as the electrically conductive devices having the greatest potential difference with which said control electrodes are connected, means for connecting the remaining electrically conductive devices between the control electrodes parallel to said electrically conductive devices having the greatest potential difference and at equipotential points relative to their own potential.

4,051,510
HUE CORRECTION APPARATUS CONTROLLED BY CHROMINANCE SATURATION

Larry Allen Cochran, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 5, 1976, Ser. No. 683,391
Int. Cl.² H04N 9/535
U.S. Cl. 358—28 **11 Claims**



1. In a system for processing color television signals including chrominance signals having a phase representative of hue and an amplitude representative of saturation of colors present in a scene, said television signals further including a reference subcarrier signal having a nominal phase relative to said chrominance signals, hue correction apparatus comprising:

means having at least a first input responsive to said reference subcarrier signal and at least a second input responsive to said chrominance signals for providing a gating signal representative of a phase relationship between said chrominance signals and chrominance signals representative of flesh tones as determined by the nominal phase of said reference subcarrier;

signal modulating means responsive to said chrominance signals and to said gating signal for passing a selected amplitude portion of said chrominance signals;

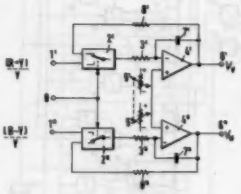
signal combining means responsive to said reference subcarrier signal and to said selected amplitude portion of said chrominance signals for providing a corrected reference subcarrier having a phase modified towards the phase of said chrominance signals according to said selected amplitude portion of said chrominance signals; and

control means responsive to the amplitude of said chrominance signals for providing a control signal for reducing the amplitude of said selected amplitude portion of said chrominance signals so as to reduce the correction of said reference subcarrier phase in the presence of chrominance signals having an amplitude representative of relatively saturated colors.

4,051,511
SYSTEM FOR AUTOMATIC COLOR BALANCE CORRECTION

Dieter Poetsch, Ober Ramstadt, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Continuation-in-part of Ser. No. 620,409, Oct. 7, 1975. This application Sept. 24, 1976, Ser. No. 726,144
Claims priority, application Germany, Sept. 11, 1974, 2448505; Sept. 27, 1975, 2543236
Int. Cl.² H04N 9/535
U.S. Cl. 358—29 **4 Claims**



1. In a system for automatic correction of the color balance of signals that control color and luminosity of a color television picture, in which system, when a prespecified luminosity gradation in the color television picture is detected and when at the same time the chroma-saturation is below a prespecified chroma-saturation threshold, a chromaticity of the television picture prevailing at this moment is stored, so as to derive, as a function of the stored chromaticity, control signals for regulating a color-correction device in such a way that a chromatic aberration in the color balance of the signals that control color and luminosity of a color television picture is reduced, the improvement comprising: integrator means operative at one time constant when said prespecified luminosity gradation in the color television picture is detected to up-integrate color difference signals, and operative at a different time constant when any luminosity other than said prespecified luminosity gradation is detected to down integrate in response to a different input signal.

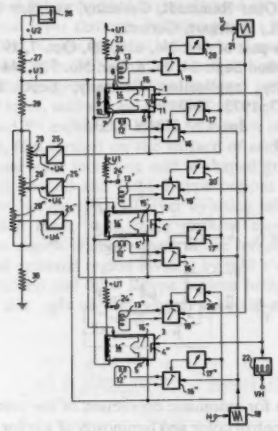
4,051,512
COLOR TELEVISION CAMERA HAVING AT LEAST TWO PICK-UP TUBES

Johannes Hendrikus Theodorus van Roosmalen, and Pieter Zuidhof, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 31, 1976, Ser. No. 672,231
Claims priority, application Netherlands, Apr. 10, 1975, 7504250
Int. Cl.² H04N 9/09
U.S. Cl. 358—51 **7 Claims**

1. A color television camera circuit for use with a plurality of camera pick-up tubes each of said tubes having electro-magnetic deflection means for line and field deflection and electrostatic focusing means for a raster scanned electron beam, said deflection and focusing means providing a substantially spatially removed action for deflection and focusing within each tube, said circuit comprising line and field deflection circuits adapted to be coupled to said deflection means respectively, each of said deflection circuits comprising a deflection stage means for adjusting the raster registration of said respective tubes, a plurality of focusing circuits adapted to be coupled to

said focusing means respectively, a voltage source, and a plurality of voltage setting stages for each of said tubes coupled



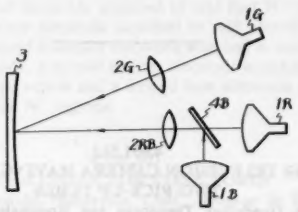
between said source and the focusing means and deflection circuits for each tube respectively.

4,051,513

COLOR IMAGE PROJECTING APPARATUS

Kouichi Takeuchi, Kamakura; Norio Itoh, Tokyo; Kuniyoshi Koyama, Chofu; Satoshi Shimada, Yokohama, and Masami Himuro, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 5, 1976, Ser. No. 664,256
Claims priority, application Japan, Mar. 12, 1975, 50-29710
Int. Cl.[2] G03B *21/00*
U.S. Cl. 358—60 **6 Claims**



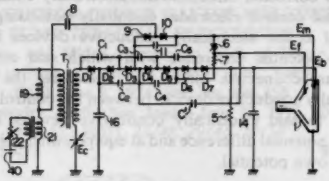
1. A color image projecting apparatus comprising: a first cathode ray tube for producing a first primary color image; first projecting lens means disposed in front of said first cathode ray tube and arranged to project said image along a first optical axis onto a screen; a second cathode ray tube for producing a second primary color image; a third cathode ray tube for producing a third primary color image and disposed at right angles to said second cathode ray tube; a dichroic mirror disposed in front of said second and third cathode ray tubes to receive said images in said second and third primary colors and synthesize therefrom a two color image; and second projecting lens means disposed to receive said two color image and project said two color image along a second optical axis intersecting said first optical axis at an acute angle at said screen, said two color image conforming in shape to said first primary color image projecting on said screen.

4,051,514

HIGH-VOLTAGE CIRCUIT FOR POST FOCUSING TYPE COLOR PICTURE TUBE

Nobuyuki Suzuki, and Toyotaro Nishihara, both of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed July 29, 1974, Ser. No. 492,926
Claims priority, application Japan, July 31, 1973, 48-85385
Int. Cl.[2] H04N *9/20*; H01J *29/08*
U.S. Cl. 358—65 **28 Claims**



1. A high voltage circuit for generating a plurality of high voltages of different values for a color picture tube of post focusing type, comprising:

a fly-back transformer including a first resonance circuit having such a parasitic constant as to be tuned to a higher harmonic with a frequency which is an odd number times as high as the fundamental frequency of fly-back pulses, said odd number being not less than 7;

a voltage-multiplying rectifier circuit with multiple stages connected to a secondary winding of said fly-back transformer and having an output terminal at the final stage thereof and another output terminal at an intermediate stage thereof, said voltage-multiplying rectifier circuit further including a plurality of rectifier elements and a plurality of capacitor elements;

a voltage stabilizing element and a resistor both connected in series between an output terminal of the *m*-th stage and another output terminal of a higher middle stage of said multiple-stage voltage-multiplying rectifier circuit; and

means for collecting a third high voltage from the junction point of said voltage stabilizing element and said resistor.

4,051,515

COLOR VIDEO SIGNAL RECORDING AND REPRODUCING APPARATUS PROVIDING PREFERENTIAL DROPOUT COMPENSATION AND TIME BASE ERROR CORRECTION

Lenard M. Metzger, and William Kelsey Hickok, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

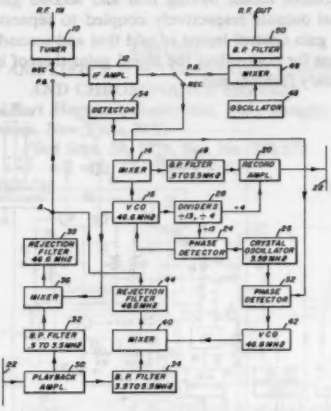
Filed Apr. 15, 1976, Ser. No. 677,101
Int. Cl.[2] H04N *5/76*
U.S. Cl. 358—8 **5 Claims**

1. Apparatus for processing a carrier-supported television signal for recording on a record medium, the carrier-supported televison signal comprised of video signal information residing on a video carrier and audio signal information residing on an audio carrier, the audio carrier being situated at a higher frequency than the video carrier, said apparatus comprising:

a. means for receiving the carrier-supported television signal having a format such that the audio carrier is at a higher frequency than the video carrier;

b. an even-numbered plurality of mixers for successively frequency converting the carrier-supported television signal so that the frequency of the video carrier after

mixing remains, frequency-wise, below the frequency of the audio carrier; and



c. means for receiving the successively frequency converted television signal and for recording the successively frequency converted televison signal on a record medium.

4,051,516

DIGITAL PROCESSING OF PAL COLOR TELEVISION SIGNALS IN THE FORM OF A Y SIGNAL AND A COMPOSITE U+V/U−V SIGNAL

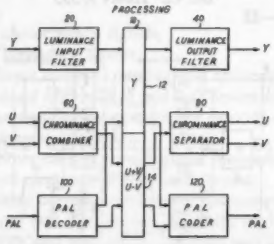
Martin Weston, Epsom, England, assignor to The Marconi Co. Ltd. and Standard Telephones and Cables Ltd., both of London, England

Filed Dec. 23, 1975, Ser. No. 643,800

Claims priority, application United Kingdom, Dec. 30, 1974, 56049/74

Int. Cl.² H04N 9/32, 9/39

U.S. Cl. 358—11 **18 Claims**



1. Apparatus for generating digital PAL chrominance signals, the apparatus including input means for receiving television signals comprising chroma signals U and V of PAL type, combining means coupled to the input means and operative to form the sum U + V of the signals U and V on one television line and their difference U − V on the next, and digitising means for digitising the signals with a sampling frequency substantially equal to the PAL colour subcarrier frequency.

4,051,517

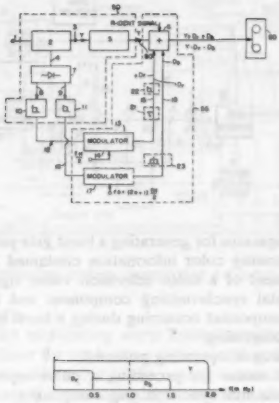
HYBRID SEQUENTIAL AND CARRIER ENCODED COLOR TELEVISION TRANSMISSION METHOD AND CIRCUITS

Bernhard A. Hjortzberg, Mission Viejo, Calif., assignor to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation-in-part of Ser. No. 515,148, Oct. 16, 1974, abandoned. This application Apr. 25, 1975, Ser. No. 571,706

Int. Cl.² H04N 9/36

U.S. Cl. 358—15 **5 Claims**



4. An apparatus for processing of a color video signal comprising:

a. means for separating the luminance information of the color video signal from the chrominance information of the color video signal;

b. means for demodulating the chrominance information into a first chrominance signal and a second chrominance signal; and

c. means for processing the luminance information, first chrominance signal, and second chrominance signal to form a line-sequentially encoded signal in which one half the sum of two successive horizontal scan lines of the encoded signal equaling the luminance information of the color video signal alternates with one half of the difference of the two successive horizontal scan lines of the encoded signal equaling the chrominance information of the color video signal;

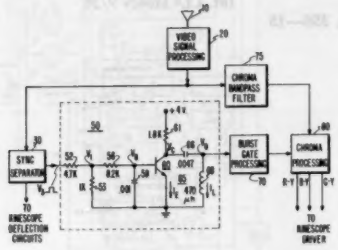
wherein said chrominance information is represented by a first chrominance signal and a second chrominance signal which are contained in two non-overlapping frequency regions; and

wherein the means for processing the luminance information, first chrominance signal, and second chrominance signal to form said encoded signal further comprises means for amplitude modulating a first suppressed carrier in dependence on one of said first and second chrominance signals, the frequency of said first suppressed carrier being an odd multiple of the video horizontal scan line frequency, means for combining the other of said first and second chrominance signals with said first amplitude modulated suppressed carrier, means for amplitude modulating a second suppressed carrier by the signal representing the combination of said other chrominance signal and said first amplitude modulated suppressed carrier, the frequency of said second carrier being an odd multiple of one half of the video horizontal scan frequency, and means for combining said luminance information of said color video signal with said second amplitude modulated suppressed carrier, thereby producing said encoded signal.

4,051,518
BURST GATE PULSE GENERATOR

Gene Karl Sendelweck, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 27, 1976, Ser. No. 661,855
Int. Cl.[2] H04N 9/46
U.S. Cl. 358—20 10 Claims



1. Apparatus for generating a burst gate pulse suitable for use in processing color information contained in a chrominance component of a color television video signal also having a horizontal synchronizing component and a color reference burst component occurring during a burst interval, said apparatus comprising:

a source of operating potential;

input means for providing a pulse representative of said horizontal synchronizing component;

transistor switch means having an inverse current conduction characteristic and an input electrode coupled to said input means, an output electrode coupled to said source of operating potential, and a common electrode, said output and common electrodes defining a main current conduction path therebetween; and

resonant circuit means comprising at least an inductance and a first capacitance, coupled across said main current conduction path of said transistor switch means and having a predetermined first time constant, said resonant circuit means being excited into ringing when said transistor switch means conducts in response to said pulse to produce a ringing waveform with a period determined by said first time constant and with a duration determined by current conduction of said transistor, wherein said resonant circuit means coacts with said inverse conduction characteristic of said transistor to render said transistor non-conductive prior to exceeding a first full cycle of said waveform, to inhibit amplitude excursions of said waveform beyond said first full cycle and to provide said waveform with an output pulse corresponding to a first full half cycle of one polarity of said waveform and coincident with said burst interval.

4,051,519
PHASE CONTROL CIRCUIT SUITABLE FOR USE IN A TINT CONTROL STAGE OF A COLOR TELEVISION SYSTEM

Leopold Albert Harwood, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 29, 1975, Ser. No. 644,820
Int. Cl.[2] H04N 9/535
U.S. Cl. 358—21 22 Claims

1. A controllable phase shifting circuit comprising:

a source of first alternating signals;

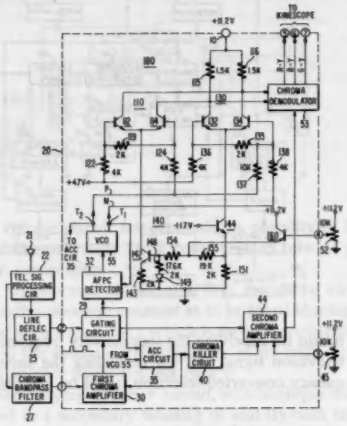
a source of second alternating signals in predetermined phase relation with said first signals;

first amplifier means having a signal input coupled to said source of first signals, and a gain control input;

second amplifier means having a signal input coupled to said source of second signals, and a gain control input;

circuit means coupled from said second source of signals to said signal input of said first amplifying means for developing a third alternating signal at said last-named input with a magnitude proportional to and a phase in predetermined relation with that of said second alternating signals;

gain control means having first and second gain control signal outputs respectively coupled to separate ones of said gain control inputs of said first and second amplifier means for controlling the signal gains thereof in complementary fashion; and

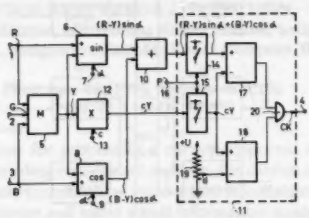


combining means for summing output signals from said first and second amplifier means to produce a resultant output signal with a phase within a range of phases between that of alternating signals applied to said signal input of said first amplifier means and that of alternating signals applied to said signal input of said second amplifier means, the phase of said resultant output signal being controlled in response to said gain control means.

4,051,520
COLOR TELEVISION CHROMA KEYING SIGNAL GENERATOR

Jan Davidse, Rotterdam, and Rudolf P. Koppe, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 9, 1976, Ser. No. 712,947
Claims priority, application Netherlands, Aug. 20, 1975, 7509871
Int. Cl.[2] H04N 9/535
U.S. Cl. 358—22 6 Claims



1. A colour television chroma keying signal generator comprising a matrix circuit means for supplying to an output a colour signal combination of colour signals supplied to inputs thereof, two signal combination and multiplication circuits coupled to the matrix circuit output, each having an adjustable multiplication factor and output means for providing colour difference signals, a signal adder circuit means coupled to said output means for forming a composite colour difference signal, and a chromaticity signal operated threshold circuit means

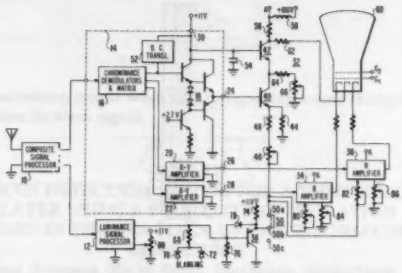
coupled to the adder circuit for supplying a chroma keying signal to an output of the generator.

4,051,521

VIDEO AMPLIFIER FOR COMBINING LUMINANCE AND CHROMINANCE SIGNALS

Leopold Albert Harwood, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 30, 1976, Ser. No. 728,171
Int. Cl.[2] H04N 9/52
U.S. Cl. 358—30 **11 Claims**



1. In a color television receiver, a video amplifier circuit for combining chrominance and luminance signal components and for supplying resultant color representative signals to an image reproducing device comprising:

means, having at least first and second terminals, for providing a direct operating voltage;

chrominance signal amplifying means comprising at least one amplifier section including a load circuit, first and second semiconductor devices of a first conductivity type, each having a control electrode and a main current conduction path associated with said control electrode, said conduction paths of said first and second devices and said load circuit being direct current coupled in series relation to said first terminal, and means for coupling a source of direct bias voltage less than said operating voltage to said control electrode of said second device;

luminance signal amplifying means comprising a third semiconductor device of a second conductivity type arranged in a voltage follower configuration and having a main current conduction path direct current coupled to said second terminal and a control electrode associated with said path;

a source of chrominance signals;

a source of luminance signals;

means for direct current coupling said chrominance signals to said control electrode of said first device such that said first and second devices operate as a cascode amplifier for said chrominance signals;

means for direct current coupling said luminance signals to said control electrode of said third device;

means for direct current coupling said main current conduction paths of said first, second and third devices in series relation with said load circuit between said first and second terminals such that a combination of chrominance signals, luminance signals and associated direct current components is produced in said main current paths of said first and second devices; and

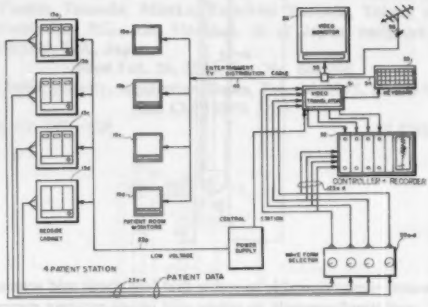
means for direct current coupling output signals from said load circuit to said image reproducing device, whereby amplified color representative signals including direct current components are provided to said image reproducing device.

4,051,522

PATIENT MONITORING SYSTEM

James W. Healy, Malibu, and Bob L. Currier, Gardena, both of Calif., assignors to Jonathan Systems, Los Angeles, Calif.

Filed May 5, 1975, Ser. No. 574,315
Int. Cl.[2] H04N 7/18
U.S. Cl. 358—86 **5 Claims**



1. A patient monitoring system comprising a central control console including:

a. a power supply;

b. a controller for establishing alarm limits for patient data;

c. a video translator for converting patient analog date into video traces representative of the analog values thereof;

d. keyboard means for generating alpha numeric data;

e. means for combining alpha numeric data with said video traces of patient analog data;

f. means for introducing said combined data into a television distribution medium;

at least one patient station including means connectable to patient sensor for amplifying a patient parameter sensor to a predetermined level;

said amplifying means powered by said power supply of said central control console;

means conducting said amplified parameter to said central control console;

wherein said video translator includes means for storing analog patient data for a selected period of time and for introducing said data into said distribution system at the end thereof; and

wherein said video translator includes means for establishing a WRITE and an ERASE cycle, including switch means for temporarily terminating the WRITE and ERASE cycle of said video translator and for enabling said recorder to record the analog data stored in said video translator.

4,051,523

SUBMERSIBLE CAMERA

Milton Laikin, Los Angeles, and George L. Hatchett, El Cajon, both of Calif., assignors to Hydro Products, Inc., San Diego, Calif.

Filed July 3, 1975, Ser. No. 593,116
Int. Cl.[2] H01J 29/89
U.S. Cl. 358—99 **7 Claims**

1. A camera which includes:

a housing;

a transparent closure at one end of said housing;

an image pick-up tube within said housing;

a lens within said housing positioned with its field of view extending through said transparent closure, adapted to form an image on said pick-up tube;

means for rotating said lens about a scan axis so that its field of view will sweep from side to side, the plane in which said lens rotates passing through the axis of said housing;

an optical joint rotatable about said scan axis to transmit said image from said lens toward said image pick-up tube;

image rotating means adapted to rotate said image on said

pick-up tube and in a plane perpendicular to the plane of rotation of said lens; and

motor means operable to rotate said lens about said scan axis and simultaneously to rotate said image rotating means.

4,051,524

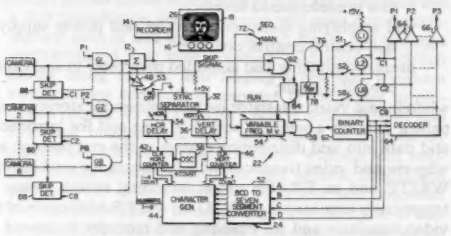
SEQUENTIAL VIDEO SWITCHING SYSTEM

Larry K. Baxter, Lexington, Mass., assignor to QSI Systems, Inc., West Newton, Mass.

Continuation of Ser. No. 535,989, Jan. 24, 1975. This application May 7, 1976, Ser. No. 684,145

Int. Cl.² H04M 7/18

U.S. Cl. 358—108 **5 Claims**



1. A video surveillance system comprising

A. two or more video cameras, each camera generating a video signal corresponding to the scene viewed by that camera,

B. means responsive to the video signals for reproducing the scenes viewed by the cameras,

C. counter means for generating a sequence of counter signals, each signal corresponding to one of said video cameras,

D. switching means connected between the cameras and the reproducing means for automatically applying the video signals from the cameras to the reproducing means in response to the counter signals for a selected time interval and in a selected sequence so that the reproducing means can reproduce the scenes viewed by said cameras during said time intervals and in said sequence,

E. means for generating, in response to the counter signals, video signals representing the characters identifying the respective video cameras, and

G. means whereby the reproducing means reproduce the camera identifying characters at a selected location in the reproduced scene.

4,051,525

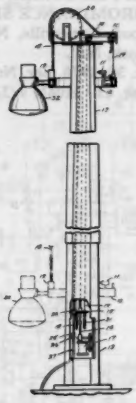
RAISABLE AND LOWERABLE SURVEILLANCE CAMERA ASSEMBLY

Daniel L. Kelly, Flushing, Mich., assignor to Anderson Safeway Guard Rail Corporation, Flint, Mich.

Filed May 17, 1976, Ser. No. 687,025

Int. Cl.² H04N 5/26

U.S. Cl. 358—108 **3 Claims**



1. In surveillance camera assembly for use with raisable and lowerable support platforms provided on high mast or pole shafts, the combination including:

a surveillance camera adapted for mounting on a raisable and lowerable support platform provided on a pole shaft;

a coaxial power and control cable operatively connected to said surveillance camera, said coaxial power and control cable in rollable engagement with a sheave member positioned at the top of the pole shaft, said coaxial cable fixedly attached to a transition plate fixedly provided on a raising and lowering drive cable within the pole shaft; and

an electrical connector plug provided at the terminal end of said coaxial cable positioned below said transition plate, said electrical connector plug adapted to selectively engage a corresponding ground-mounted coaxial cable positioned at the base of the pole shaft.

4,051,526

TELEVISION SYSTEM COMPRISING A VIDEO STORAGE DEVICE AND A TELEVISION RECEIVER

Wolfgang Otto Gotthard Steinkopf, Eindhoven, Netherlands, and Rudolf Drabek, Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 3, 1975, Ser. No. 592,866

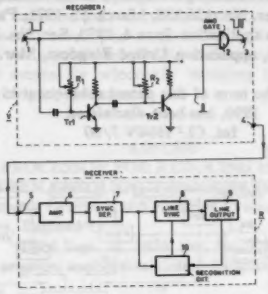
Claims priority, application Netherlands, July 15, 1974, 7409514

Int. Cl.² G11B 5/02

U.S. Cl. 358—127 **3 Claims**

1. A television receiver for use with both a standard television signal and a recorded television signal from a player that adds an identification signal, said receiver comprising a switch-

able circuit, means for recognizing said identification signal, and means for switching said switchable circuit in response to



said reconizing means when said recognizing means recognizes said identification signal.

4,051,527

FOCUS DETECTION SYSTEM FOR A VIDEO DISC PLAYER USING A PLURALITY OF RADIATION SENSORS IN THE FAR FIELD OF THE INFORMATION STRUCTURE

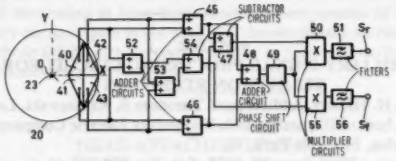
Josephus Johannes Maria Braat, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 23, 1976, Ser. No. 669,641

Claims priority, application Netherlands, Jan. 28, 1976, 7600843

Int. Cl.[2] H04N 5/76; G11B 7/12

U.S. Cl. 358—128 **11 Claims**



1. Apparatus for reading a record carrier on which information is stored in an optically readable track-shaped information structure, said apparatus comprising a radiation source; a radiation-sensitive information signal detector; objective system means for directing a radiation beam from said radiation source to a spot on the information structure of the record carrier and for thereafter directing said radiation from said record carrier to said radiation-sensitive information signal detector; means for relatively moving said record carrier and said radiation spot; and a focus error detection system comprising two radiation-sensitive focus signal detectors disposed in the far field of the information structure at one side of a plane defined by the optical axis of the objective system means and a line normal to the center line of the track portion on which said radiation is directed, said detectors being disposed symmetrically relative to a line effectively extending transversely to the track direction, a subtraction circuit having inputs connected to said two focus signal detectors, an adder circuit connected to said two focus signal detectors, a multiplier circuit, shift circuit means for connecting outputs of said adder circuit and said subtraction circuit to said multiplier circuit and for relatively phase shifting the outputs of said adder circuit and said subtraction circuit, and filter circuit means connected to the output of said multiplier circuit for transmitting only frequencies lower than a frequency corresponding to twice the average spatial frequency of the information structure in the track direction multiplied by the relative velocity of the radiation spot and the record carrier in the track direction, a focus signal being thereby provided from an output of said filter circuit means.

4,051,528

APPARATUS FOR OPTICALLY RECONSTRUCTING INFORMATION

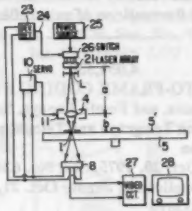
Yasutsugu Takeda, Tokorozawa; Hisashi Nakamura, Tokyo; Yoshito Tsunoda, Mitaka; Toshihisa Tsukada, Tokyo, and Toshimitsu Miyauchi, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 26, 1976, Ser. No. 661,806

Claims priority, application Japan, Feb. 26, 1975, 50-22878

Int. Cl.[2] H04N 5/86

U.S. Cl. 358—128 **12 Claims**



1. In an apparatus for optically reconstructing information provided on a disc on which a plurality of information bearing dots are arrayed in at least one track, including means to rotate said disc, a light source capable of projecting a beam onto the plurality of dots, and a photodetector which detects diffracted light waves from the plurality of dots, the improvement beng characterized in that said light source comprises an array formed of a plurality of semiconductor light emitting elements which can be driven independently and said photodetector comprises at least one set of light detecting elements capable of detectng a deviation of said beam from the tracks of dots, and further including driving means responsive to said photodetector for individually driving selected light emitting elements in said array to effect a tracking of said array of dots by said light source.

4,051,529

FOCUS CONTROL SYSTEM WITH MOVABLE MIRROR

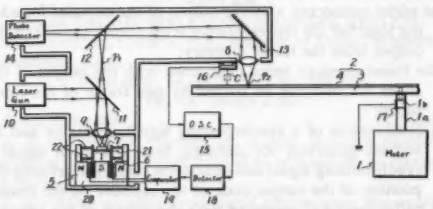
Senri Miyaoka, Zushi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed June 15, 1976, Ser. No. 696,830

Claims priority, application Japan, June 19, 1975, 50-74659

Int. Cl.[2] H04N 5/76; G11B 7/12

U.S. Cl. 358—128 **12 Claims**



1. A focus control system for an optical record carrier having a reflective surface, said system comprising:

a. a light beam source;

b. first lens means disposed facing said reflective surface and spaced therefrom along a first optical path section for focusing a light beam from said light beam from source on said reflective surface;

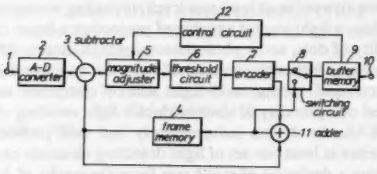
c. a movable mirror;

d. second lens means disposed facing said movable mirror and spaced therefrom along a second optical path section;
e. means for directing an incident light beam from said light beam source onto said movable mirror through said second lens means;
f. means for directing a light beam reflected from said movable mirror through said second lens means to said reflective surface of said carrier through said first lens means; and
g. means for driving said movable mirror so that the distance between said movable mirror and said second lens means along said second optical path section is controlled in response to the distance between said reflective surface of said carrier and said first lens means along said first optical path section, whereby said directed light beam to said reflective surface remains focused on said reflective surface in spite of fluctuations of said reflective surface.

4,051,530
FRAME-TO-FRAME CODING SYSTEM

Hideo Kuroda, Kodaira, and Fumio Kanaya, Seki, both of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Oct. 20, 1975, Ser. No. 624,021
Claims priority, application Japan, Oct. 21, 1974, 49-121165; Nov. 18, 1974, 49-132016
Int. Cl.² H04N 7/12
U.S. Cl. 358—136 **10 Claims**

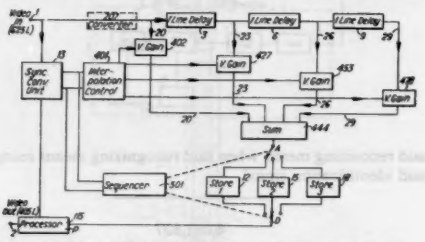


1. An interframe coding system comprising:
a subtracter for outputting a difference signal between an input signal and an output from a frame memory;
a magnitude adjuster connected with the output of the subtracter for controlling the magnitude of the difference signal;
an encoder connected with the output of the magnitude adjuster for quantizing the output therefrom to output a code having a smaller number of bits than that of the difference signal, and including means for converting the code into a representative level output signal having the same number of bits as that of the difference signal and indicative of a quantization level;
an adder connected with the output of the encoder for adding together the representative level output signal and the output from the frame memory;
the frame memory being connected with the output of the adder for delaying its output by one frame of the input signal;
a combination of a synchronizing signal generator and an address generator for deriving from the input signal a synchronizing signal and an address signal for defining the position of the output code of the encoder on the frame;
a buffer memory connected with the output of the encoder for receiving the code output therefrom and the outputs from the synchronizing signal generator and the address generator, which are written into the buffer memory and read out therefrom as code signals of a uniform bit rate; and
a controller for monitoring the occupancy of the buffer memory to thereby control the magnitude adjuster in accordance with the occupancy so as to prevent an overflow of the buffer memory.

4,051,531
TELEVISION SYSTEMS

John Lewis Edwin Baldwin, Croydon, England, assignor to Independent Broadcasting Authority, Great Britain

Division of Ser. No. 126,538, March 22, 1971, Pat. No. 3,742,135. This application June 4, 1973, Ser. No. 366,595
Claims priority, application United Kingdom, Mar. 26, 1970, 14976/70
The portion of the term of this patent subsequent to June 26, 1990, has been disclaimed.
Int. Cl.² H04N 5/00
U.S. Cl. 358—140 **2 Claims**

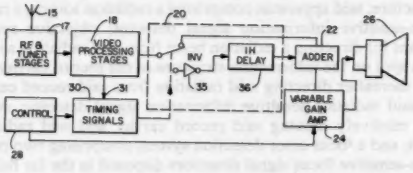


1. An apparatus for the processing of digitized input signals of high bit rate which comprises storage elements arranged to provide *n* similar paths, means operable to distribute the digitized signal between said paths and write them in the storage elements thereof so that the bit rate within a single path is one *n*th of said high bit rate and the total bit rate of the writing is said high bit rate, means for reading out the signals from the storage elements to provide *n* digital outputs, one from each path, and means for combining the *n* digital outputs to provide a delayed replica of the digitized input signals having said high bit rate.

4,051,532
AUXILIARY SIGNAL PROCESSING CIRCUIT FOR TELEVISION RECEIVERS

Francis H. Hilbert, Addison, and Theodore S. Rzeszewski, Lombard, both of Ill., assignors to Matsushita Electric Company of America, Franklin Park, Ill.

Filed June 19, 1975, Ser. No. 588,250
Int. Cl.² H04N 7/08
U.S. Cl. 358—142 **8 Claims**



1. A television receiver for selectively displaying conventional television signals and auxiliary television signals on the cathode ray tube thereof, wherein the conventional television signals comprise a composite signal containing at least video information and horizontal and vertical synchronizing signal components, and said auxiliary signal components comprise alternating signal portions containing opposite-polarity, redundant information during successive ones of the signal portions thereof, said receiver including in combination:
means for simultaneously processing a combined signal comprising said conventional signals and said auxiliary signal components for producing a video signal to be displayed on the cathode ray tube of the receiver wherein the redundant and opposite polarity portions of said auxil-

iary signal are substantially visually cancelled from the display on said cathode ray tube;

selectively operated switching circuit means responsive to at least some of the synchronizing signal components of the composite television signal for processing said combined signal to cause the redundant auxiliary signal portions to be visually reinforced so that the auxiliary signal components are reproduced on said cathode ray tube; and

control means for selectively initiating operation of said switching circuit means.

4,051,533

SIGNAL PROCESSOR FOR REDUCING INTERFERENCE BETWEEN FREQUENCY-MODULATED SIGNALS

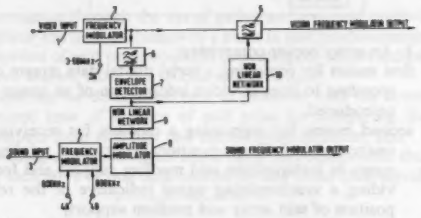
Frank Anthony Griffiths, 105 Hillcroft Crescent, Oxhey, Hertfordshire, England

Filed Sept. 21, 1976, Ser. No. 725,281

Claims priority, application United Kingdom, Sept. 24, 1975, 39195/75

Int. Cl.² H04N 7/06; H04B 15/00

U.S. Cl. 358—167 **6 Claims**



1. A method of reducing the interference between a primary frequency-modulated carrier signal and a secondary frequency-modulated carrier signal, comprising both increasing the amplitude of the secondary frequency-modulated carrier signal and decreasing at least those sideband components of the primary carrier signal in the region of the secondary carrier signal as those sideband components tend to increase to interfere with the secondary carrier signal.

4,051,534

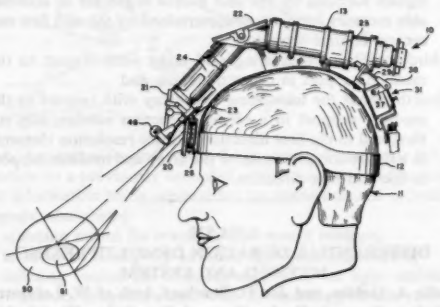
HEAD ATTACHED TELEVISION

Peter P. Dukich, Blaine; Isaac W. Metzger, Robbinsdale, and John A. Volk, West St. Paul, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 27, 1976, Ser. No. 735,934

Int. Cl.² H04N 5/30

U.S. Cl. 358—210 **4 Claims**



1. In a remotely controlled head-mounted visual apparatus for viewing manual operations carried on by the wearer, said apparatus including camera means for generating signals representative of a visual image received, aiming and focusing means for said camera means, remote control means for controlling said aiming and focusing means, means for reconverting said signals to reproduce said visual image, means for transmitting said signals from said camera means to said means for reconverting, real-time viewing means for viewing said reconverted image, and mounting means for mounting said camera, aiming and focusing means on the head of said wearer, the improvement comprising:

forward directed illumination means fixed on said head-mounted apparatus in a manner such that the location of the field lighted thereby is determined locally by the attitude of the head of said wearer.

4,051,535

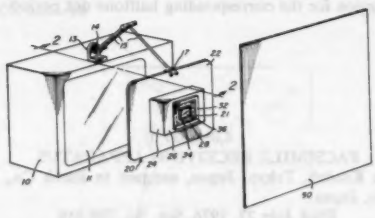
MAGNIFICATION OF TELEVISION IMAGES

James M. Inglis, 24 Cotton Ave., Braintree, Mass. 02184

Filed Apr. 9, 1976, Ser. No. 675,603

Int. Cl.² H04N 5/72

U.S. Cl. 358—231 **10 Claims**



1. A system for magnifying a television image comprising:

a fresnel lens of focal length up to 10 inches,

an enclosure fitting all around the circumference of said lens and extending in a direction parallel to the optical axis of the lens,

a means defining an aperture in the end of said enclosure away from said lens,

a means for intercepting light arranged in combination with said lens so that if a television image source is placed on the side of the lens-opposite to the direction in which said enclosure extends, substantially along the optical axis of the lens and within 18 inches of the lens, substantially all light emitted from said source and not passing through said lens will be intercepted,

the distance between said lens and said aperture being between 20% and 50% of said focal length, and

the area of said aperture being between 25% and 50% of the area of said lens.

4,051,536

ELECTRONIC HALFTONE IMAGING SYSTEM

Paul G. Roetling, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 14, 1975, Ser. No. 558,594

Int. Cl.² H04N 1/22

U.S. Cl. 358—298 **12 Claims**

1. A method for creating on a light sensitive recording medium a halftone reproduction of an original image comprising the steps of:

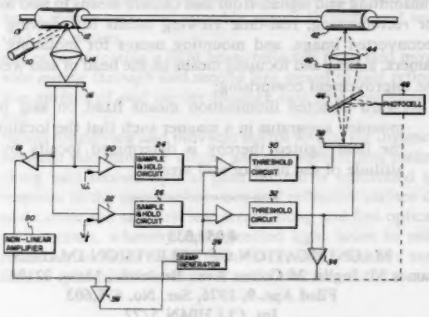
a. providing an electronic signal representing the average gray scale of said original image over a halftone dot period;

b. providing a plurality of electronic signals representing details of said original image over said halftone dot period;

c. providing a halftone screen function in electronic form;

d. combining said halftone screen signals of (c) with said original image signals of (b) to provide a plurality of sum functions; and

e. dynamically adjusting the threshold for each of said sum functions so as to match the average gray scale of the



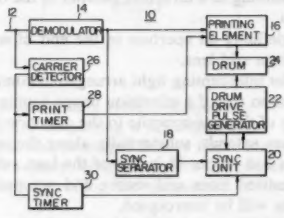
original image over a halftone dot period with the sum function for the corresponding halftone dot period.

4,051,537

FACSIMILE RECEIVING APPARATUS

Mitsuru Kondoh, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed July 27, 1976, Ser. No. 709,019
Claims priority, application Japan, July 31, 1975, 50-93815
Int. Cl.[2] H04N *1/36*
U.S. Cl. 358—264 **6 Claims**



1. A facsimile receiving apparatus responsive to a synchronization signal and a picture signal for reproducing a picture corresponding to the picture signal, the synchronization signal being produced for a first predetermined length of the time followed by the picture signal, the apparatus comprising:

printing means including printing element means responsive to the picture signal and scan drive means;

synchronization means responsive to the synchronization signal for synchronizing the scan drive means in accordance therewith;

synchronization timing means responsive to initiation of the synchronization signal and connected to enable the synchronization means to receive the synchronization signal only for a second predetermined length of time between said initiation of the synchronization signal and termination thereof, the second predetermined length of time being shorter than the first predetermined length of time; and

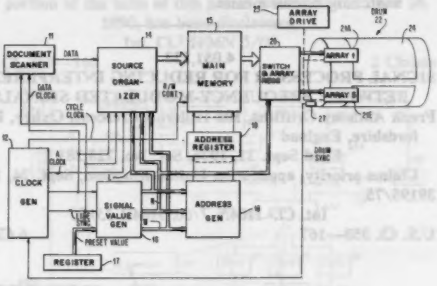
print timing means responsive to said initiation of the synchronization signal and connected to enable the printing element means to receive the picture signal only after a third predetermined length of time after said initiation of the synchronization signal.

4,051,538

INK JET COPIER

Sidney Jared Fox; Van Clifton Martin, and Danny Allen Van Hook, all of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 28, 1976, Ser. No. 700,632
Int. Cl.[2] H04N *1/22*
U.S. Cl. 358—296 **6 Claims**



1. An array copier comprising:

first means for providing a serial digital data stream corresponding to lines of video information of an image to be reproduced;

second means for supporting a medium for receiving the image and including a positionable array of printing elements in juxtaposition said medium support and for providing a synchronizing signal indicative of the relative position of said array and medium support;

clock means responsive to said synchronizing signal from said second means for providing first control signals;

a first control signal generator responsive to said first control signals for providing second control signals corresponding to positional information relative to said serial digital data stream;

a source organizer responsive to said first and second control signals for receiving and storing said serial digital data stream in predetermined storage locations under control of said first control signals and for supplying said stored data signals from different predetermined storage locations under control of said first and second control signals;

random access memory means responsive to the said first and second control signals for alternately reading the data signals stored in addressable memory locations predetermined by the said first and second control signals and providing the said signals to the array of printing elements included in the said second means for controlling the state of the said printing elements and for storing the data signals supplied by the said source organizer in addressable memory locations predetermined by the said first and second control signals;

third means for translating said array with respect to the medium support in a first direction; and

fourth means for translating said array with respect to the medium support in a second direction substantially orthogonal to the first direction N print resolution elements in a single complete scan of the array and medium support in the said first direction.

4,051,539

DIFFERENTIAL DURATION DEMULTIPLEXING METHOD AND SYSTEM

Leslie A. Geddes, and Joe D. Bourland, both of W. Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

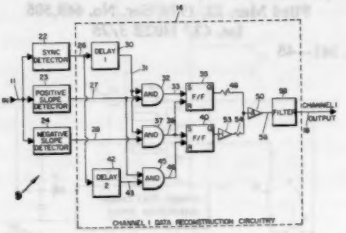
Filed Apr. 30, 1976, Ser. No. 681,832
Int. Cl.[2] G11B *5/02*
U.S. Cl. 360—44 **5 Claims**

1. A method for demultiplexing a pulse train signal reflecting

data encoded through utilization of a time variable technique, said method comprising:

receiving said pulse train signal;

determining through the use of gating and a first multivibrator the time of presence of a pulse in a predetermined portion of said pulse train and providing an output indicative thereof from the first multivibrator;



determining through the use of gating and a second multivibrator the time of absence of a pulse in said predetermined portion of said pulse train and providing an output indicative thereof from the second multivibrator;

comparing the determined time of presence with the determined time of absence of said pulse by comparing the outputs from said first and second multivibrators; and

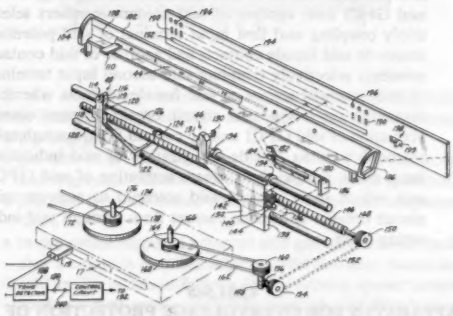
providing an output signal based upon said comparison that is indicative of said data carried by said pulse train signal.

4,051,540

INSTRUCTION INDICATING APPARATUS FOR A RECORD AND/OR PLAYBACK DEVICE

Leslie N. Wilder, New Rochelle, N.Y.; James C. Whitney, Fairfield, Conn., and Gary Matison, Tempe, Ariz., assignors to Dictaphone Corporation, Rye, N.Y.

Filed Apr. 20, 1976, Ser. No. 678,697
Int. Cl.[2] G11B *15/18*
U.S. Cl. 360—72 **13 Claims**



1. Apparatus for indicating the location of particular information on a previously recorded record medium, said particular information being represented by predetermined recorded signals, comprising:

scanning means for scanning said record medium;

an array of selectively actuable light emitting sources;

indexing means for scanning said array of light emitting sources in synchronism with the scanning of said record medium, said indexing means being in actuating relation sequentially with each of said light emitting sources;

detecting means for detecting the presence of said predetermined recorded signals during the scanning of said record medium to produce an actuating signal; and

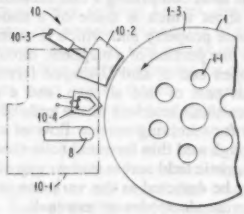
temporary storage means for temporarily storing said actuating signal until said indexing means is in actuating relation with an unenergized light emitting source to energize said light emitting source.

4,051,541

ACCESS TO FLOPPY DISK STACK

Bernard William McGinnis, and James Amos Weidenhammer, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 8, 1975, Ser. No. 638,792
Int. Cl.[2] G11B *5/60, 5/82, 25/04*
U.S. Cl. 360—98 **16 Claims**



1. In a mass storage flexible disk file containing multiple flexible storage disks rotating coaxially in a spaced stack configuration, said stack receiving ventilation fluid internally to replenish ambient fluid expelled from between said disks by centrifugal action, the pressure of said received fluid being variable to cause storage surfaces of said disks to rotate alternatively in distinct first and second states of axial displacement equilibrium, said states serving respectively to inhibit and support formation of a circumferentially uniform auto-sustaining split suitable for storage transducing access at any axial coordinate position in said stack when said stack is transiently disturbed at said position, the method of quickly and precisely aligning a source of said transient disturbance with a target coordinate position in said stack prior to formation of said circumferentially uniform split comprising:

while said ventilation pressure is controlled to retain said surfaces in said first state of equilibrium, applying an external disturbance at a selected trial position in said stack estimated to coincide with said target coordinate but subject to imprecise determination due to varying motion of the eges of the disks interfacing at said target coordinate; said disturbance forming and sustaining a partial split having circumferentially irregular shape at said trial position; said partial split being unsuited for storage transducing access;

determining location of said partial split relative to said target coordinate by using a widened portion of said partial split as a relatively stable positional reference for distinguishing said relative location;

when said trial position coincides with said target coordinate position varying the pressure of said ventilation fluid to form said auto-sustaining split at said target coordinate position; and

when said trial and target positions do not coincide, shifting the position of said external disturbance incrementally until said trial and target positions do coincide and then excecuting said above-mentioned pressure varying step to form said auto-sustaining split.

4,051,542

MAGNETIC HEAD WITH THIN SHEET EXHIBITING MAGNETORESISTIVE PROPERTY

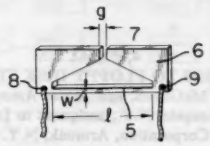
Kenji Kanai, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed Aug. 18, 1975, Ser. No. 605,223

Claims priority, application Japan, Aug. 20, 1974, 49-95762; Aug. 20, 1974, 49-95763; Aug. 20, 1974, 49-95764

Int. Cl.² G11B *5/12, 5/22*

U.S. Cl. 360—113 **6 Claims**



1. A magnetic head comprising a thin substantially U-shaped ferromagnetic sheet which is made of a material exhibiting magnetoresistance property and which is connected magnetically in at least one portion of a magnetic circuit having an air gap with the open end of said U-shaped ferromagnetic sheet forming at least part of said air gap, and a pair of current electrodes or terminals attached to the ends of said thin ferromagnetic sheet for receiving current flow of a predetermined magnitude through said thin ferromagnetic sheet, whereby the variation in magnetic field across said air gap of said ferromagnetic sheet may be detected as the variation in voltage across said pair of current electrodes or terminals.

4,051,543

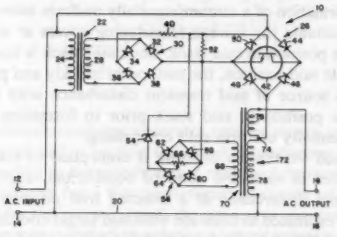
OVER VOLTAGE PROTECTOR USING CURRENT MONITORING

Norvel Jeff McLellan, 1002 N. Main St., Pleasanton, Tex. 78064

Filed Jan. 12, 1976, Ser. No. 648,010

Int. Cl.² H02H *9/04*

U.S. Cl. 361—18 **7 Claims**



1. An over voltage regulator for alternating voltages to prevent an output voltage exceeding a predetermined peak voltage, said regulator comprising:

first diode bridge connected to one of two input terminals;

transistor means connected across said first diode bridge for current flow therethrough;

an output transformer having a primary and secondary winding, said primary winding being connected on one side thereof to a common input and output terminal and towards the other side of said primary winding to said first diode bridge;

means for biasing said transistor means in response to an A.C. input, said biasing means being connected between a base of said transistor means and one side of said first diode bridge;

first rectifying means connected to said secondary winding for rectifying voltages received therefrom;

Zener diode means connected to said rectifying means, said Zener means also being connected in parallel with said biasing means, said Zener diode means conducting to prevent a further increase in bias voltage when said output voltage reaches said predetermined peak voltage.

4,051,544

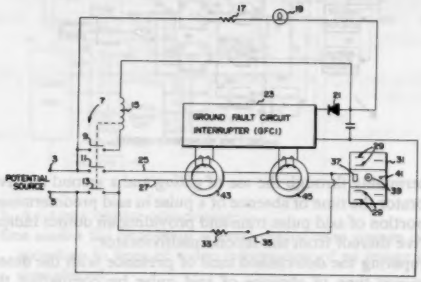
FAIL-SAFE GROUND FAULT RECEPTACLE CIRCUIT

Edward J. Vibert, Muncy, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Mar. 23, 1976, Ser. No. 669,505

Int. Cl.² H02B *3/28*

U.S. Cl. 361—45 **2 Claims**



1. A fail-safe ground fault receptacle circuit comprising:

a pair of parallel connected female contacts formed to receive an electrical load;

a GFCI unit;

a potential source having first and second input terminals;

circuit means including a series connected impedance and indicating lamp coupling said first input terminal of said potential source to said GFCI unit and conductor means directly connecting said second input terminal of said potential source to said GFCI unit; and

circuit breaker means including a plurality of ganged contact members and a solenoid winding, one of said contact menbers selectively coupling said first input terminal of said potential source to said solenoid winding coupled to said GFCI unit, another of said contact members selectively coupling said first input terminal of said potential source to said female contacts and another of said contact members selectively coupling said second input terminal of said potential source to said female contacts whereby manually activating said circuit breaker means causes activation of said GFCI unit by current flow through said solenoid winding and de-energization of said indicating lamp and a ground fault causes activation of said GFCI unit which short circuits said solenoid to activate said circuit breaker and cause current flow through said indicating lamp.

4,051,545

APPARATUS FOR OVERVOLTAGE PROTECTION OF A DIRECT CONVERTER IN THE ROTOR CIRCUIT OF AN ASYNCHRONOUS MACHINE

Albert Kloss, Nussbaumen, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Jan. 6, 1976, Ser. No. 646,979

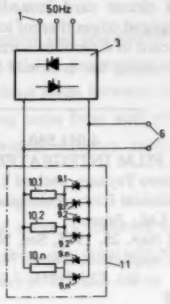
Claims priority, application Switzerland, Jan. 16, 1975, 523/75

Int. Cl.² H02H *7/122*

U.S. Cl. 361—58 **6 Claims**

1. Apparatus for overvoltage protection of a direct converter utilizing controllable semi-conductor valves and whose output is connected to the rotor circuit of an asynchronous electrical machine which comprises a stepped impedance circuit connected across the output of said direct converter, said impedance circuit being constituted by a plurality of imped-

ance elements selectively connectible electrically in parallel, and a stepped current valve switching circuit comprising controllable semi-conductor valves connected respectively in circuit with said impedance elements, the valves of said switching circuit being controlled in accordance with the amplitude of any transient overvoltage induced in said rotor circuit such that the total resistance of said impedance circuit varies inversely with the amplitude of said overvoltage.

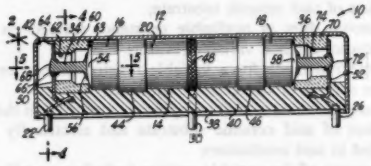


4,051,546

GAS TUBE ARRESTER PROTECTOR

Eric A. Scheithauer, Chicago, Ill., assignor to Cook Electric Company, Morton Grove, Ill.

Filed Dec. 4, 1975, Ser. No. 637,713
Int. Cl.² H02H 3/22
U.S. Cl. 361—124 **5 Claims**



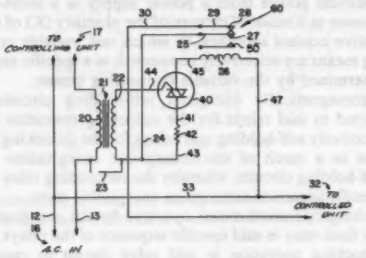
1. An overvoltage arrester protector for protecting telephone lines from high voltages and surge currents comprising:
a housing means,
a gas tube overvoltage arrester having a first line electrode and a ground electrode coupled to a reference potential,
a first line terminal means coupled to one of said telephone lines,
a cavity means disposed adjacent said gas tube arrester such that a cavity is disposed adjacent said first line electrode, said cavity means includes a first insulating spacer means having a first cavity extending through said first spacer means from a first end of said first spacer means to the second end of said first spacer means, said first cavity being closed at said first end by said first line electrode and said first cavity being closed at said second end by said first terminal means,
a first fusible lead coupling said first terminal means to said first line electrode, said first fusible lead extends through said cavity and is in thermal relationship with said gas tube arrester, said first fusible lead being fusibly connected to said first line electrode and to said first terminal means so as to assist in maintaining said first terminal means against said second end of said first spacer means, and
maintaining means to maintain said gas tube arrester in said housing.

4,051,547

SOLID STATE RELAY

Frederick Wood, 8111 Yonge St., Apt. 1504, Thornhill, Ontario, Canada

Filed Oct. 16, 1975, Ser. No. 623,092
Int. Cl.² H01H 47/22
U.S. Cl. 361—160 **2 Claims**



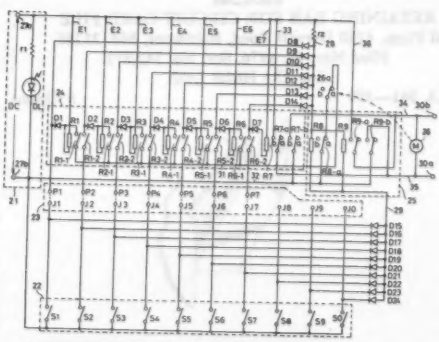
1. An electrical relay control circuit device comprising power input means connectable to a source of electrical power for receiving power therefrom, first power output means connectable to a controlling load unit device for delivering power from said power input means thereto, second power output means connectable to a controlled load unit device for delivering power from said first power input means thereto, and switching circuit means between said power input means and second power output means for selectively regulating the delivery of said power to said controlled load unit device in response to the flow or nonflow of power to said first power output means, said switching circuit means including normally closed relay switch means between said power input means and said second power output means, and solid state bidirectional switch means for opening said relay means to de-energize said controlled unit in response to the flow of power from said power input means to said first power output means.

4,051,548

ELECTRIC LOCKING DEVICE

Morio Hamada, Hino, Japan, assignor to Tokao Murata, Tokyo, Japan

Filed Dec. 9, 1975, Ser. No. 639,174
Claims priority, application Japan, Aug. 14, 1975, 50-98042; Aug. 14, 1975, 50-98043
Int. Cl.² H01H 47/00
U.S. Cl. 361—171 **1 Claim**



1. An electric locking device comprising:
locking means for performing locking and unlocking operations;
a plural number (n) of manipulative control switches;
presetting circuit means having a plural number (k) of vari-

able connecting means, respectively connected to said manipulative control switches, for selectively varying and presetting connection states with respect to said manipulative control switches;

a relay circuit for effecting an unlocking operation comprising a plurality (k) of relays for unlocking operation respectively connected to the variable connecting means of said presetting means and being successively supplied with electrical power from a power supply in a short-circuit manner as a result of closure of the plurality (K) of manipulative control switches, to which said variable connecting means are selectively connected, in a specific sequence determined by the variable connecting means;

electromagnetically energized self-holding circuits connected to said relays for the unlocking operation for respectively self-holding said relays for the unlocking operation as a result of electromagnetic energization of the self-holding circuits, whereby the succeeding relay in said specific sequence assumes an energizable state;

unlocking operation means operated by the energization of the final relay in said specific sequence of the relays for the unlocking operation in said relay circuit to cause said locking means to perform the unlocking operation;

a relay circuit for releasing the self-holding including one relay for releasing self-holding connected in a by-pass circuit to both sides of said presetting circuit means and to said relay circuit for the unlocking operation in parallel therewith;

said one relay for releasing self-holding not being energized when said relays for an unlocking operation are successively energized in a short-circuit manner as a result of closure of the manipulative control switches in said specific sequence, said one relay for releasing self-holding being energized in bypass circuit manner only when any one relay for the unlocking operation is not energized as a result of closure of the manipulative control switches in a sequence other than that corresonding to said specific sequence, thereby causing all the self-holding circuits of the relays for the unlocking operation to open for returning the device to the state prior to manipulation of said manipulative control switches; and

a relay circuit for locking operation including one relay for a locking operation connected in parallel with said circuit for releasing self-holding;

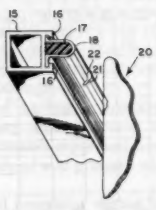
said one relay for the locking operation, when said locking means is unlocked, being energized as a result of closure of at least any but the first in the sequence of the plurality (n) of manipulative control switches and operating said unlocking operation means to cause said locking means to perform the locking operation.

4,051,549

RETAINING BAR FOR CIRCUIT CARD FILE

L. Gail Fiege, 4210 Darnall Road, Baltimore, Md. 21236

Filed Nov. 17, 1976, Ser. No. 742,571
Int. Cl.² H02B *1/02*
U.S. Cl. 361—399 **5 Claims**



1. A circuit card retaining bar assembly for a circuit card file, said retaining bar assembly including an elongated bar hingedly mounted upon said file for movement to a latched retaining position extending across the open side of the card file and having a retention face opposed to the edges of circuit cards contained in said file, said retention face comprising a composite structure including:

A. a resilient element for engagement with the edges of said cards,

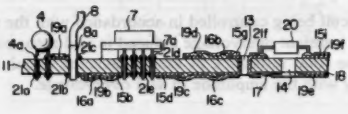
B. a rigid element including means embracing portions of the sides of said circuit card immediately adjacent to the resiliently engaged edges thereof to define limits of movement of said card in directions normal to the plane thereof when said retaining bar is in said latched retaining position.

4,051,550

THICK FILM INTEGRATED CIRCUITS

Shougo Seno; Tatsuro Toyama, both of Yokohama; Teruo Takai, Isehara, and Yasuomi Ueda, Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 25, 1975, Ser. No. 635,237
Claims priority, application Japan, Nov. 29, 1974, 49-136193
Int. Cl.² H05K *1/04*
U.S. Cl. 361—402 **6 Claims**



1. A thick film integrated circuit comprising:

a ceramic substrate;

conductors formed on at least one surface of said ceramic substrate;

printed fixed resistances formed on at least one surface of said ceramic substrate so as to be connected to said conductors formed on said one surface;

a conductor for a variable resistor formed on the other surface of said ceramic substrate;

a protection film of negligible resistance formed on said conductor for said variable resistor;

a printed resistance for a variable resistor formed on the other surface of said ceramic substrate;

externally mounted circuit components mounted on the one surface of said ceramic substrate and electrically connected to said conductors;

the elements of the variable resistor including an adjusting shaft and a slider member which constitute said variable resistor in cooperation with said printed resistance for the variable resistor; and

means for mounting said variable resistor elements on the other surface of said ceramic substrate.

4,051,551

MULTIDIMENSIONAL PARALLEL ACCESS COMPUTER MEMORY SYSTEM

Duncan H. Lawrie, Champaign, Ill., and Chandrakant Ratilal Vora, Audubon, Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed May 3, 1976, Ser. No. 682,526
Int. Cl.² G06F *15/16, 15/32*
U.S. Cl. 364—200 **6 Claims**

1. A parallel data processing storage and accessing system comprising:

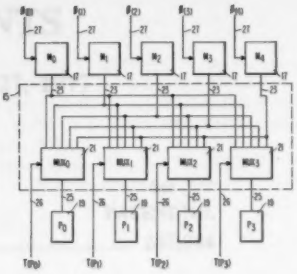
a plurality of memory modules for storing a matrix and for providing non-conflicting access to matrix elements along all individual linear vectors thereof, each module in said plurality of memory modules having a plurality of addressable storing locations, each location therein capable of storing a single matrix element, the number of memory modules in said plurality thereof being relatively prime to the memory ordering of each linear vector of said matrix stored, wherein the memory ordering of each linear vec-

tor is equal to the distance between two consecutive elements therein times the increment to be accessed;

a plurality of data processing units, each unit therein for performing data processing operations on matrix elements;

alignment means interposing said plurality of memory modules and said plurality of data processing units for providing data communications paths between designated individual data processing units from said plurality thereof and designated individual memory modules from said plurality thereof;

tag generating means cooperating with said alignment means and said plurality of memory modules for designating individual data processing units from said plurality thereof and individual memory modules from said plurality thereof for data communications therebetween and for addressing each memory module in said plurality thereof



whereby matrix elements along all individual linear vectors of said matrix stored are non-conflictingly accessible.

DESIGN PATENTS

GRANTED SEPTEMBER 27, 1977

ERRATA

For CLASS	See PATENT NO.
087–001 R	245,944

DESIGNS

SEPTEMBER 27, 1977

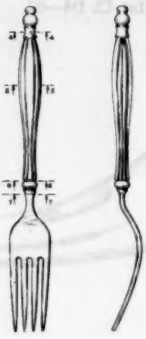
245,881
COMBINED SWIMMING SUIT AND INFLATABLE COLLAR
Ronald Desmond Siddons, 197 Princes Highway, Sylvania, New South Wales 2224, Australia
Filed Aug. 13, 1974, Ser. No. 496,971
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—40

245,882
COMBINED SWIMMING SUIT AND INFLATABLE COLLAR
Ronald Desmond Siddons, 197 Princes Highway, Sylvania, New South Wales 2224, Australia
Division of Ser. No. 496,971, Aug. 13, 1974. This application Feb. 19, 1976, Ser. No. 659,333
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—40

245,883
ELECTRIC COMPLEXION BRUSH
Masao Tsuji, North Plainfield, and William J. Rakocy, Nutley, both of N.J., assignors to North American Philips Corporation, New York, N.Y.
Filed Apr. 26, 1976, Ser. No. 680,110
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—14

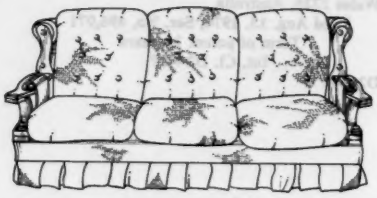
245,884
FOLDABLE SOLAR COOKER
Donald L. Jackson, 7359 Alix Parkway, Sacramento, Calif. 95823
Filed June 30, 1975, Ser. No. 591,645
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—107

245,885
ARTICLE OF FLATWARE
Robert J. King, Wallingford, Conn., assignor to International Silver Company, Meriden, Conn.
Filed May 3, 1976, Ser. No. 682,356
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137



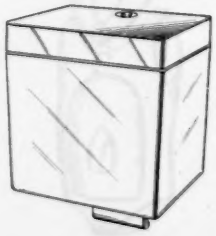
245,886
CHAIR
Robert L. Wilson, Senatobia, Miss., assignor to Chromcraft Corporation, Amsterdam, N.Y.
Filed Aug. 15, 1975, Ser. No. 604,961
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

245,887
SOFA OR SIMILAR ARTICLE
Lester Beall, High Point, N.C., assignor to Trend Line Furniture Corporation, Amsterdam, N.Y.
Filed Oct. 9, 1975, Ser. No. 621,198
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



245,888
SEAT
Mario Bellini, Milan, Italy, assignor to B & B Italia S.p.A., Milan, Italy
Continuation of Ser. No. 559,138, March 17, 1975, and Ser. No. 559,139, March 17, 1975. This application Oct. 28, 1976, Ser. No. 736,342
Claims priority, application Italy, Sept. 19, 1974, 21970/74
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—71

245,889
SOAP DISPENSER
Antonio Macchi Cassia, Milan, Italy, assignor to Steiner American Corporation, Salt Lake City, Utah
Filed July 19, 1976, Ser. No. 706,371
Claims priority, application Italy, May 21, 1976, 21,463/76
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—95

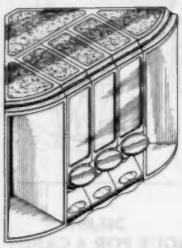


245,890

DISPENSER TO BE MOUNTED IN CORNERS

Benjamin King Milbourne, Jr., San Pedro, Calif., assignor to Safe Concepts, Incorporated, Gardena, Calif.

Filed July 27, 1976, Ser. No. 709,198
Term of patent 14 years
Int. Cl. D23—*02;* D6—*04*
U.S. Cl. D6—95

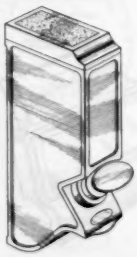


245,891

DISPENSER

Benjamin King Milbourne, Jr., San Pedro, Calif., assignor to Safe Concepts, Incorporated, Gardena, Calif.

Filed July 27, 1976, Ser. No. 709,197
Term of patent 14 years
Int. Cl. D23—*02;* D6—*04*
U.S. Cl. D6—95

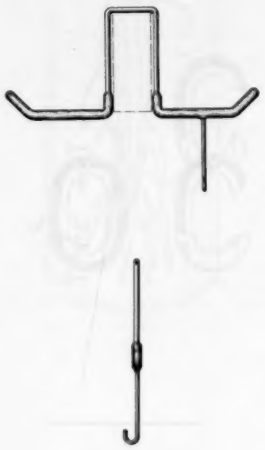


245,892

COMBINED STORAGE RACK FOR SKIS AND SKI POLES

Wyett M. Yocum, 5025 Dixon Line Way, Sacramento, Calif. 95821

Filed June 4, 1976, Ser. No. 693,087
Term of patent 14 years
Int. Cl. D6—*04, 08*
U.S. Cl. D6—113



245,893

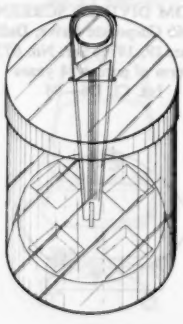
ROOM DIVIDER SCREEN

Donald N. Page, 12060 Corporate Drive, Dallas, Tex. 75228

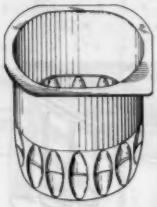
Filed Apr. 19, 1976, Ser. No. 677,871
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—139

245,894
SPLIT LINK
Ruediger Einhorn, Katonah, and Lee Richard Chasen, Port Chester, both of N.Y., assignors to Coats & Clark, Inc., Stamford, Conn.
Filed Jan. 14, 1976, Ser. No. 648,953
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—499

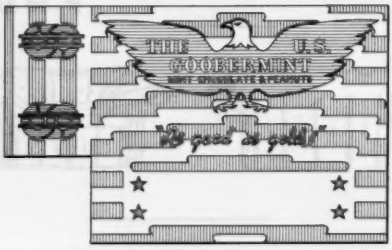
245,895
COMBINED CARRIER AND DISPLAY CONTAINER FOR BEVERAGE CONTAINERS OR THE LIKE
Reinhart Krooss, Mainz, Germany, assignor to Kuemmerling GmbH, Bodenheim, Germany
Filed Feb. 28, 1975, Ser. No. 554,148
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—179



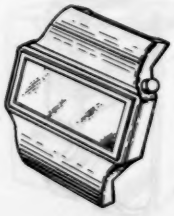
245,896
CONTAINER FOR LIQUIDS OR THE LIKE
Raymond Charles Philippon, Saint-Cloud, France, assignor to Etudes Realisations de Chaines Automatiques (E.R.C.A.), Orsay, France
Filed Sept. 29, 1975, Ser. No. 617,372
Claims priority, application France, Mar. 28, 1975, 75.1248
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—220



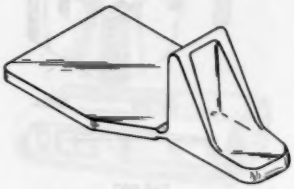
245,897
APPLIQUE FOR A CANDY BOX
John Clinton Evans, Jr., P.O. Box 138, North Olmsted, Ohio 44070, and Harold Eugene Kautz, 5923 Clearview Drive, Parma Heights, Ohio 44130
Filed July 18, 1975, Ser. No. 597,147
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—245



245,898
CASING FOR AN ELECTRONIC WRISTWATCH OR THE LIKE
Brent Nilson, San Jose, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.
Filed Oct. 24, 1975, Ser. No. 625,428
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38



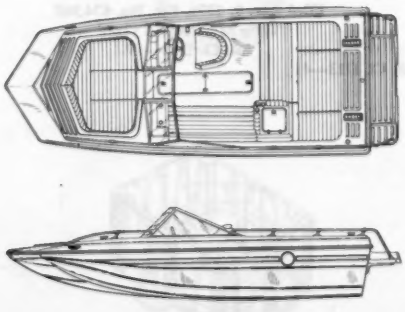
245,899
ELECTRONIC WATCH ACTUATOR
Howard Kenig, Bristol, Pa., assignor to Consumer Products Management Corporation, Philadelphia, Pa.
Filed Jan. 19, 1976, Ser. No. 650,381
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—128



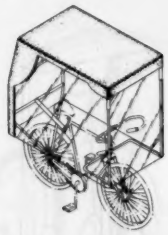
245,900
NON-SMOKERS PLAQUE
John A. Lambrecht, 121 E. Live Oak, San Gabriel, Calif. 91775
Filed Mar. 29, 1976, Ser. No. 671,560
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—133

245,901
PLAQUE
Donald R. Ditto, 4938 Sharp St., Dallas, Tex. 75247
Filed Jan. 23, 1976, Ser. No. 651,618
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—139

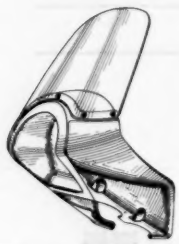
245,902
BOAT
Roy A. Rogers, 7801 Driftwood Court, Lake Country Estates, Fort Worth, Tex. 76179
Filed Sept. 29, 1976, Ser. No. 728,016
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62



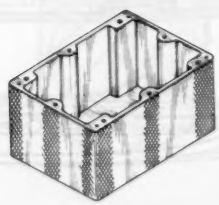
245,903
PROTECTIVE COVER FOR A BICYCLE
James Harris, Jr., 105 Rose St., Buffalo, N.Y. 14204
Filed May 14, 1976, Ser. No. 686,320
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—156



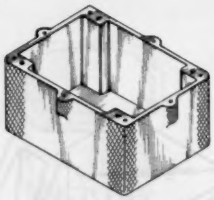
245,904
MOTORCYCLE FAIRING
Craig W. Vetter, Rantoul, Ill., assignor to Vetter Fairing Company, Rantoul, Ill.
Filed Aug. 4, 1976, Ser. No. 711,533
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—182



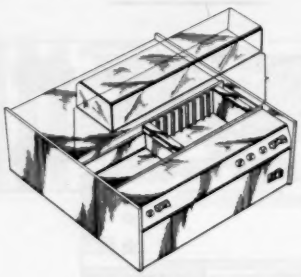
245,905
ENCLOSURE FOR ELECTRICAL COMPONENTS OR THE LIKE
Philip W. Taylor, Howell, Mich., assignor to Taylor Industries, Inc., Howell, Mich.
Filed Apr. 8, 1976, Ser. No. 674,965
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D13—41



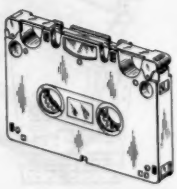
245,906
ENCLOSURE FOR ELECTRICAL COMPONENTS OR THE LIKE
Philip W. Taylor, Howell, Mich., assignor to Taylor Industries, Inc., Howell, Mich.
Filed Apr. 8, 1976, Ser. No. 675,128
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D13—41



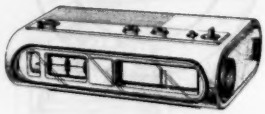
245,907
CASSETTE CHANGER OR THE LIKE
Fred C. Bolick, Jr., Atlanta, Ga., assignor to Lanier Business Products, Inc., Atlanta, Ga.
Filed Oct. 6, 1972, Ser. No. 295,452
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—6



245,908
TAPE CASSETTE
Yoshio Kishi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed June 25, 1976, Ser. No. 699,797
Claims priority, application Japan, Dec. 27, 1975, 50-51655
Term of patent 14 years
Int. Cl. D14—*99*
U.S. Cl. D14—11

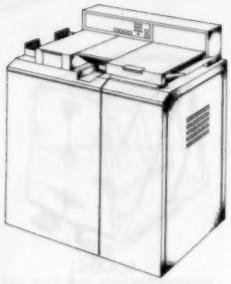


245,909
CLOCK RADIO
Takeyoshi Kawano, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Nov. 18, 1975, Ser. No. 633,137
Claims priority, application Japan, May 20, 1975, 50-20069
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—73

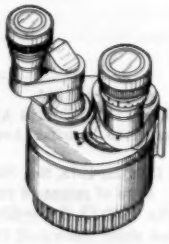


245,910
CULTIVATOR TINE
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland
Filed Jan. 5, 1976, Ser. No. 646,553
Claims priority, application Belgium, July 18, 1975, 50.446.00
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—29

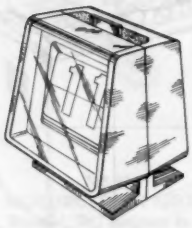
245,911
ELECTROPHOTOGRAPHIC MACHINE OR THE LIKE
Ernest Michael Bevilacqua, Wilton; Allen Dana Hawthorne, and Eliot Fette Noyes, both of New Canaan, all of Conn., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 4, 1976, Ser. No. 663,643
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—27



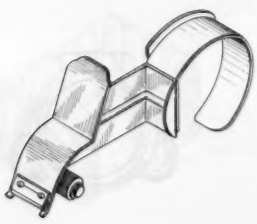
245,912
MICROSCOPE OPTICAL ASSEMBLY
Kazuo Masuyama, Osaka; Kuniomi Abe, Kobe, and Yuji Makawa, Nishnomiya, all of Japan, assignors to Konan Camera Research Institute, Japan
Filed Jan. 21, 1976, Ser. No. 651,119
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—58



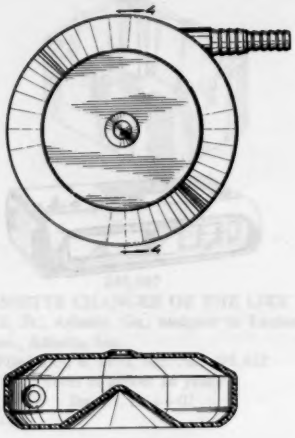
245,913
DATE CALENDAR
William Macowski, Caldwell, N.J., assignor to Ketcham & McDougall, Inc., Roseland, N.J.
Filed Apr. 16, 1976, Ser. No. 677,802
Term of patent 14 years
Int. Cl. D19—*03*
U.S. Cl. D19—25



245,914
COMBINED TAPE DISPENSER AND APPLICATOR
George H. Fritzinger, 15 Standish Ave., West Orange, N.J. 07052
Filed Dec. 22, 1975, Ser. No. 643,395
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—69

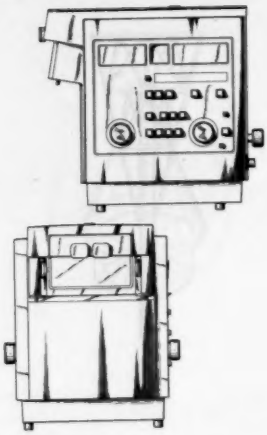


245,915
SPRINKLER
Wells Sixten Ragnar Pearson, Gnosjo, Sweden, assignor to Gnosjoplast AB, Sweden
Filed Apr. 7, 1976, Ser. No. 674,315
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—13

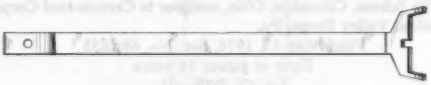


245,916
LAWN SPRINKLER VALVE HANDLE
Robert W. Thede, 1740 N. Catalina St., Burbank, Calif. 91505
Filed July 14, 1976, Ser. No. 705,068
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—28

245,917
OPTOMETER
John T. Armbruster, Niagara Falls, N.Y., assignor to American Optical Corporation, Southbridge, Mass.
Filed Sept. 17, 1976, Ser. No. 723,850
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—17

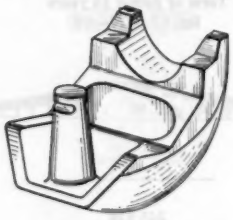


245,918
COMBINATION TIBIAL RESECTION AND TALAR DRILL GUIDE
George Shen, Warsaw, Ind., assignor to Zimmer, U.S.A. Inc.
Filed Oct. 1, 1976, Ser. No. 728,705
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—26



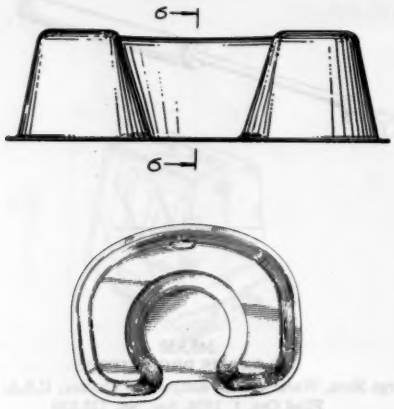
245,919
TALAR RESECTION GUIDE
George Shen, Warsaw, Ind., assignor to Zimmer, U.S.A. Inc.
Filed Oct. 1, 1976, Ser. No. 728,706
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—26

245,920
OS CALSIS PROSTHESIS
George Shen, Warsaw, Ind., assignor to Zimmer, U.S.A. Inc.
Filed Oct. 1, 1976, Ser. No. 728,830
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—33



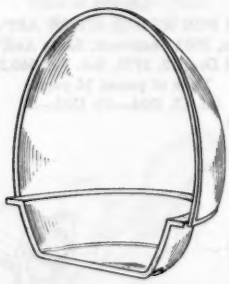
245,921
COUPLER FOR RESPIRATORY APPARATUS
Anthony V. Beran, 3802 Teakwood, Santa Ana, Calif. 92707
Filed Dec. 15, 1975, Ser. No. 640,399
Term of patent 14 years
Int. Cl. D24—*99*; D23—*01*
U.S. Cl. D24—53

245,922
DISPOSABLE SUPPORT FOR A DISPOSABLE BED PAN
Kenneth Wilson Mills, 11 Redcar Road, Smithills Dean, Bolton, Lancashire, England
Filed Oct. 8, 1975, Ser. No. 620,582
Claims priority, application United Kingdom, Apr. 26, 1975, 970884/75
Term of patent 14 years
Int. Cl. D24—04
U.S. Cl. D24—57



245,923
BUILDING WITH INTEGRAL RAMPS
William L. Shaffer, 254 Victoria, Costa Mesa, Calif. 92627
Filed Mar. 19, 1976, Ser. No. 668,434
Term of patent 14 years
Int. Cl. D25—03
U.S. Cl. D25—3

245,924
WINDOW SEAT ASSEMBLY
Martin Hardy Hansen, 8626 Gilley, Burnaby, British Columbia, Canada (V5J 4Y5)
Filed Feb. 17, 1976, Ser. No. 658,226
Term of patent 14 years
Int. Cl. D25—02
U.S. Cl. D25—35

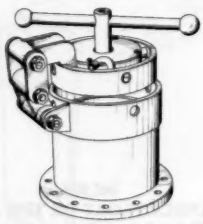


245,925
GEODESIC GRAPE ARBOR
John L. Debes, III, 303 Erie Street Road, Macedon, N.Y. 14502
Filed July 12, 1976, Ser. No. 704,417
Term of patent 14 years
Int. Cl. D25—99
U.S. Cl. D25—71

245,926
CEILING TILE
Phillip Schuss, Columbus, Ohio, assignor to Certain-teed Corporation, Valley Forge, Pa.
Filed May 13, 1976, Ser. No. 686,633
Term of patent 14 years
Int. Cl. D25—01
U.S. Cl. D25—80

245,927
GLASS BIRD HOUSE OR THE LIKE
Edward M. Edwards, Sylvania, and Theodore H. Harbaugh, Maumee, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio
Filed Oct. 18, 1976, Ser. No. 733,831
Term of patent 14 years
Int. Cl. D30—*2*
U.S. Cl. D30—3

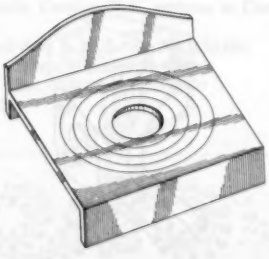
245,928
AIR LOCK FOR PRESSURIZED CHAMBERS
Tormod Frafjord, Hj. Johansens gt. 28, N-4000 Stavanger, Norway
Filed Oct. 2, 1975, Ser. No. 619,011
Claims priority, application Norway, May 13, 1975, 56643/75
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D31—24



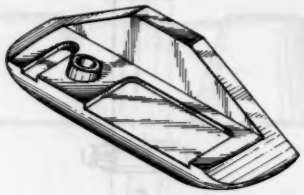
245,929
FIRE EXTINGUISHER BRACKET
Roger Jay Montambo, Red Wing, Minn., assignor to The Ansul Company, Marinette, Wis.
Filed June 2, 1975, Ser. No. 582,888
Term of patent 14 years
Int. Cl. D29—*01*
U.S. Cl. D29—5

245,930
BOY DOLL
Dovie Blankenship, 4708 W. 26th Ave., Gary, Ind. 46406
Filed May 28, 1976, Ser. No. 690,833
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

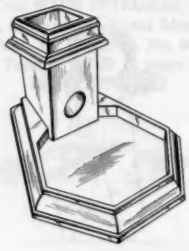
245,931
LAWN GAME GOAL
Harold E. Alter, 24680 Kelly Road, and Roger W. Alter, 22488 Rein, both of East Detroit, Mich. 48021
Filed Aug. 2, 1975, Ser. No. 606,562
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 PP



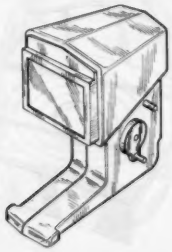
245,932
GOLF PUTTER HEAD
Roger Pete Lowry, 3444 Scott Circle, Salt Lake City, Utah 84115
Filed Dec. 11, 1975, Ser. No. 639,663
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



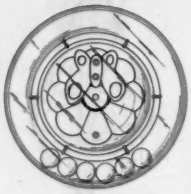
245,933
DICE AGITATOR
Stephen E. Blum, 8 Ledgewood Road, Framingham, Mass. 01701
Filed Jan. 9, 1976, Ser. No. 647,974
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 GG



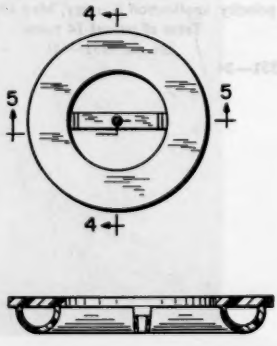
245,934
TOY PROJECTOR
Linda Jansen Donaldson, Cincinnati, Ohio, assignor to General Mills Fun Group, Inc., Minneapolis, Minn.
Filed June 16, 1975, Ser. No. 587,948
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 R



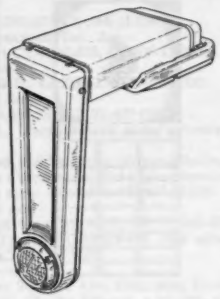
245,935
AUDIBLE FIGURE TOY
Albert Stubbmann, Franklin Lakes, N.J., assignor to Kohner, Inc., New York, N.Y.
Filed Aug. 29, 1975, Ser. No. 609,118
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 C



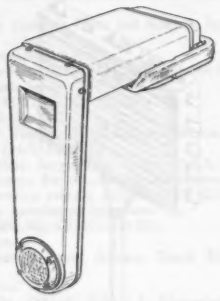
245,936
CANDLE FLOAT OR THE LIKE
Gary B. Roush, Painted Post, N.Y., assignor to Corning Glass Works
Filed June 10, 1976, Ser. No. 694,898
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D48—2



245,937
UNDERWATER LIGHTING MODULE
Frank D. Shaw, 185 Markland Drive, Etobicoke, Ontario, Canada
Filed July 22, 1975, Ser. No. 598,059
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 E

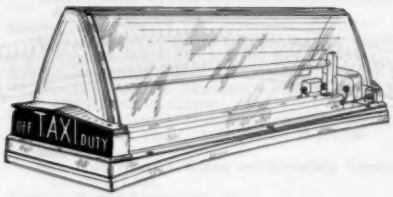


245,938
UNDERWATER LIGHTING MODULE
Frank D. Shaw, 185 Markland Drive, Etobicoke, Ontario, Canada
Filed July 22, 1975, Ser. No. 598,060
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 E



245,939
LAMP
Chester Urban, 2832 Wilmot St., Philadelphia, Pa. 19137
Filed May 27, 1976, Ser. No. 690,451
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 C

245,940
COMBINED TAXI LIGHT AND ILLUMINATED ADVERTISEMENT DISPLAY
James Rembrandt George, Garden City, N.Y., assignor to Vango Media, Inc., New York, N.Y.
Filed Sept. 15, 1975, Ser. No. 613,046
Term of patent 14 years
Int. Cl. D26—*06*; D20—*03*
U.S. Cl. D48—32 R



245,941
PERCUSSION MUSICAL INSTRUMENT
John E. Loftus, 2210 Douglas Drive North, Minneapolis, Minn. 55422
Filed Nov. 25, 1974, Ser. No. 527,165
Term of patent 14 years
Int. Cl. D17—*04*
U.S. Cl. D56—1 E

245,942
DECALCOMANIA OR SIMILAR ARTICLE FOR CULINARY WARE
Estelle G. Rothstein, Corning, N.Y., assignor to Corning Glass Works
Filed Nov. 7, 1975, Ser. No. 630,665
Term of patent 14 years
Int. Cl. D19—*08*; D7—*01*
U.S. Cl. D96—12 R

245,943

DECALCOMANIA FOR CULINARY WARE

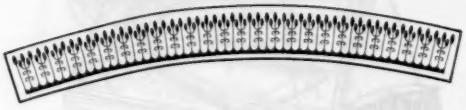
William C. McBurney, New Castle, Pa., and Thomas J. Strawser, Jr., Corning, N.Y., assignors to Corning Glass Works

Division of Ser. No. 632,452, Nov. 17, 1975. This application Feb. 10, 1977, Ser. No. 767,552

Term of patent 14 years

Int. Cl. D5—*06*

U.S. Cl. D96—12 R



245,944

CARPET SAMPLE DISPLAY CARRIER

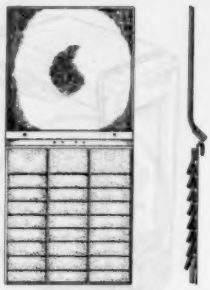
James L. Benson, Newport Beach, Calif., assignor to Custom Carpets, Inc., Fountain Valley, Calif.

Filed Jan. 22, 1976, Ser. No. 651,364

Term of patent 14 years

Int. Cl. D20—*02*

U.S. Cl. D87—1 R



245,945

PORTABLE ILLUMINATED SIGN

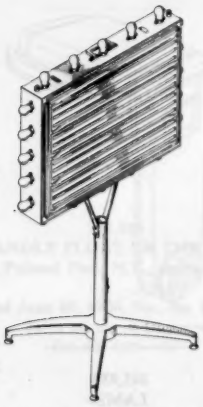
Steven Mihojevich, Elkhart, Ind., assignor to Metaline Products, Inc., Elkhart, Ind.

Filed Oct. 15, 1976, Ser. No. 732,819

Term of patent 14 years

Int. Cl. D20—*03*

U.S. Cl. D96—12 R



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF SEPTEMBER, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Dick Company: *See*—
Thomas, Richard E.; Florence, Robert T.; Dalal, Rustom H.; and Scheuer, Raymond I., 4,051,283, Cl. 428-29.000.

A/S Hotaco: *See*—
Benthin, Finn, 4,050,677, Cl. 366-11.000.

AAA Products International Inc.: *See*—
Womack, Robert C., 4,050,835, Cl. 408-11.000.

AAI Corporation: *See*—
Sweeney, Patrick E., 4,050,680, Cl. 266-48.000.

AB Nike Hydraulik: *See*—
Borup, Jorgen, 4,050,287, Cl. 72-457.000.

Abadie, Henry J. L. Transistorized static inverters. 4,051,413, Cl. 315-219.000.

Abbas, Shakir Ahmed; and Dockerty, Robert Charles, to International Business Machines Corporation. Field effect transistor structure and method of making same. 4,051,273, Cl. 427-86.000.

Abbott Laboratories: *See*—
Dunnigan, Daniel Ambrose, 4,051,190, Cl. 260-651.00R.

Abbott, Richard, to Fruehauf Corporation. Dual adhesive method and article. 4,051,286, Cl. 428-77.000.

Abe, Shinichiro: *See*—
Gendron, Aubrey Stewart; Abe, Shinichiro; Ettel, Victor Alexander; and O'Neill, Charles Edward, 4,051,000, Cl. 204-106.000.

Aboshi, Michihiro: *See*—
Koseki, Toshinori; Maeda, Kunio; Aboshi, Michihiro; and Kinoshita, Haruo, 4,051,096, Cl. 260-31.80M.

Abreu, Joao do Espirito Santo. Helical band antenna. 4,051,481, Cl. 343-895.000.

Acar, Ali, to International Telephone and Telegraph Corporation. Valve. 4,050,477, Cl. 137-625.650.

Ackermann, Hans; and Beffa, Fabio, to Ciba-Geigy AG. Water-soluble disazo dyestuffs containing a 3- or 4-[pyrazolylene-(1)-benzoylamino]-6-sulphophenyl moiety. 4,051,118, Cl. 260-153.000.

Ackermann, Josef: *See*—
Rohrl, Franz; Ackermann, Josef; and Detterbeck, Heinrich, 4,051,347, Cl. 219-400.000.

Ackrell, Jack, to Syntex (U.S.A.) Inc. 6,11-Dihydrodibenzo-[b.e.]-thiepin-11-one-3-acetonitrile. 4,051,149, Cl. 260-327.00B.

Ackrell, Jack: *See*—
Prince, Anthony; Halpern, Otto; and Ackrell, Jack, 4,051,148, Cl. 260-327.00B.

Acme-Cleveland Corporation: *See*—
Skingle, Thomas Jerome, 4,050,840, Cl. 408-144.000.

Acroform Corporation: *See*—
Miller, Jack V., 4,050,403, Cl. 116-124.00R.

Acton, John Edward: *See*—
Robbins, Joseph Henry, deceased; and Acton, John Edward, 4,050,674, Cl. 254-93.00H.

Adalbert, Gerhard; Hess, Jurgen; and Hecht, Ulrich, to Robert Bosch G.m.b.H. Arrangement for controlling the operation of a cooling system in an automotive vehicle. 4,050,263, Cl. 62-243.000.

Adamovske strojirny, narodni podnik: *See*—
Hynst, Karel, 4,050,383, Cl. 101-349.000.

Adams, Frank H.: *See*—
Knapik, H. Peter G.; and Adams, Frank H., 4,051,018, Cl. 208-139.000.

Adams, Jack W.: *See*—
Kemper, James M.; O'Neill, Robert J.; Wagenhals, Bruce E.; and Adams, Jack W., 4,050,102, Cl. 4-10.000.

Adamson, Arthur P., to General Electric Company. Composite airfoil construction. 4,051,289, Cl. 428-113.000.

Adelman, Stanley M.; Ellington, Donal G.; and Quatrochi, Philip J., to United States of America, Army. Method for producing explosive trains. 4,050,347, Cl. 86-20.00R.

Adolf Diener, Apparate- U. Maschinenbau: *See*—
Bosch, Karl; and Fritzenschaft, Max, 4,050,285, Cl. 72-391.000.

Adrema Pitney Bowes: *See*—
Heider, Michael; and Gurgens, Rainer Eberhard, 4,050,565, Cl. 197-6.300.

AGFA-Gevaert Aktiengesellschaft: *See*—
Maas, Dieter; and Linke, Gerda, 4,051,500, Cl. 354-239.000.
Wagensonner, Eduard; Huber, Theodor; and von Fischern, Bernhard, 4,050,795, Cl. 352-141.000.

Ahlgren, Nils Harald. Methods of shifting heavy and/or loaded structures. 4,050,255, Cl. 61-45.00C.

Ahlgren, Raymond E.; Schwoerer, Danial W.; and Lundstrom, Boyce H., to Bullseye Glass Co. Process for opalizing glass. 4,050,947, Cl. 106-52.000.

Ahmed, Adel Abdel Aziz, to RCA Corporation. Current-operated circuits and structures. 4,051,391, Cl. 307-297.000.

Ahrweiler, Karl-Heinz, to Kusters, Eduard. Roller chain guide arrangement. 4,050,872, Cl. 425-371.000.

Aine, Harry E. Infrared optoacoustic gas analyzer having an improved gas inlet system. 4,051,372, Cl. 250-343.000.

Aisan Kogyo Kabushiki Kaisha: *See*—
Sakai, Toshimitsu; Saitou, Tadashi; and Suzuki, Isamu, 4,050,861, Cl. 417-471.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Inada, Masami; Kawabata, Yasuhiro; Sato, Katsujiro; and Osanai, Akinori, 4,050,423, Cl. 123-117.00A.

Aizawa, Tatsuo: *See*—
Ueda, Yasuo; Kamezawa, Yasutoki; Aizawa, Tatsuo; and Ikeda, Toshimitu, 4,051,052, Cl. 252-62.10L.

Akamatsu, Katsutaro: *See*—
Murakami, Shinichi; Akamatsu, Katsutaro; and Hiraishi, Hisashi, 4,050,927, Cl. 75-122.000.
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Akasaka, Shigeo: *See*—
Iida, Yozo; Akasaka, Shigeo; and Kawahara, Yasuhito, 4,051,496, Cl. 354-219.000.

Akopian, Nikolai Rubenovich: *See*—
Tagirov, Kurban Magomedovich; Akopian, Nikolai Rubenovich; Konontsev, Valery Vasilievich; and Lutsenko, Jury Nikolaevich, 4,050,529, Cl. 175-422.000.

Aktiebolaget Motala Verkstad: *See*—
Book, Nils Evert Erling, 4,050,863, Cl. 425-84.000.

Akzo N.V.: *See*—
Kilsdonk, Harley, 4,050,866, Cl. 425-192.00S.

Akzona Incorporated: *See*—
Pannekeet, Wilhelmus; Steenken, Gerhard E. W. K.; and Voogd, Roeland H., 4,051,221, Cl. 423-54.000.

Aladdin Industries, Incorporated: *See*—
Seiverling, John S., 4,050,442, Cl. 126-213.000.

Albanese, Damian F.; and Waer, Richard R., to International Telephone and Telegraph Corporation. Large area motion sensor using pseudo-random coding technique. 4,051,472, Cl. 343-5.0PD.

Albert Haag KG: *See*—
Haag, Walter, 4,050,649, Cl. 242-130.100.

Albertine, Herman, Jr.; Craycraft, Donald G.; and Coleman, William E., to NCR Corporation. Circular plasma charge display device. 4,051,408, Cl. 315-169.00R.

Albright, Alva Z. Cam actuated tree cutting shears and buncher. 4,050,488, Cl. 144-309.0AC.

Alcan Research and Development Limited: *See*—
Gnyra, Bohdan, 4,051,222, Cl. 423-127.000.

Aldrich, Francis William, to Bendix Corporation, The. Carbon metallic friction composition. 4,051,097, Cl. 260-38.000.

Alduk, Frank P., to Newcastle Company, Inc. Case packer container feeding apparatus. 4,050,217, Cl. 53-62.000.

Alfranseder, Josef: *See*—
Rebsdat, Siegfried; Mayer, Sigmund; and Alfranseder, Josef, 4,051,068, Cl. 252-412.000.

Alleman, Raymond J.; Batina, Raymond T.; and Clark, Ralph J., to Libby, McNeil & Libby. Can fabrication system. 4,050,394, Cl. 113-120.00R.

Allemand, Pierre M., to S.A. Beauplat Fils & Cie. Improvements in a turret alignment system. 4,050,337, Cl. 83-552.000.

Allied Chemical Corporation: *See*—
Bishop, Robert J., 4,050,483, Cl. 141-4.000.
Hoare, Robert C., 4,051,155, Cl. 260-379.000.
Kurtz, Bruce E.; and Smalley, Edmund W., 4,051,193, Cl. 260-683.300.
Tanner, Lee Elliot; Ray, Ranjan; and Cline, Carl F., 4,050,931, Cl. 75-175.500.
Wells, Rodney Lee; and Crescentini, Lamberto, 4,051,196, Cl. 260-857.0PG.

Allis-Chalmers Corporation: *See*—
Kohl, Robert F.; Karis, Lyle A.; and Shy, James L., 4,050,882, Cl. 432-14.000.

Allyn, Jerome B.; Wileman, Richard D.; and Kozak, John, to Midland-Ross Corporation. Method for continuously casting a strip of alloyed metal. 4,050,502, Cl. 164-68.000.

Almo Manifold & Tool Company: *See*—
Courson, Richard B., 4,050,633, Cl. 239-550.000.

Alphatype Corporation: *See*—
Tidd, James Alfred, 4,051,488, Cl. 354-13.000.

Altec Corporation: *See*—
Henricksen, Clifford A., 4,050,541, Cl. 181-159.000.

Altermatt, Ruedi, to Sandoz Ltd. Monoazo compounds having a 5-nitrothiazolyl-2 diazo component radical and a 1,4-phenylene coupling component radical having an n-(alkyl or allyl)-n-(alkoxyl- or alkoxyethoxy-ethoxycarbonyloxyalkyl)amino group in its para position. 4,051,120, Cl. 260-158.000.

Alton Box Board Company: *See*—
Wilkinson, Robert M.; and Lyon, James R., 4,051,277, Cl. 427-288.000.

Altshuler, Saul, to TRW Inc. ELF vertical dipole antenna suspended from aircraft. 4,051,479, Cl. 343-703.000.

Aluminum Company of America: *See*—
Haupin, Warren E., 4,050,302, Cl. 73-190.00H.

Aluminum Pechiney: *See*—
Duclaux, Daniel; Pontier, Andre J. A.; and Ferret, Georges Paul, 4,051,224, Cl. 423-210.000.

Amagai, Susumu; and Oikawa, Shigeru, to Nissan Motor Co., Limited. Intake air warming device. 4,050,430, Cl. 123-122.00D.

Amano, Yoshinari: *See*—
Motoyoshi, Kenya; Kume, Masahiro; and Amano, Yoshinari, 4,050,930, Cl. 75-173.00A.

Amaudric du Chaffaut, Patrick; and Petrulacci-Stephanopoli, Georges. Sling device for suspending animals or articles. 4,050,416, Cl. 119-97.00R.

Ambrogi, Vittorio; Logemann, Willy; Parenti, Marc'Antonio; and Tommasini, Raffaele, to Carlo Erba, S.p.A. Pyrazine 4-oxide derivatives and process for their preparation. 4,051,245, Cl. 424-250.000.

Amemiya, Kunio: *See*—
Tsuruta, Motohiro; Kimura, Hiroshiro; Koshimo, Akio; Nara, Hirohisa; Goto, Tokuju; and Amemiya, Kunio, 4,051,215, Cl. 264-137.000.

Amerace Corporation: *See*—
Storck, Glenn E.; and Kominiak, Andrew A., 4,050,149, Cl. 29-630.00R.

American Color & Chemical Corporation: *See*—
Botros, Raouf, 4,051,119, Cl. 260-156.000.

American Cyanamid Company: *See*—
Asato, Goro, 4,051,183, Cl. 260-553.00A.
Bernstein, Seymour; Lenhard, Robert Herman; and Conrow, Ransom Brown, 4,051,176, Cl. 260-506.000.

American District Telegraph Company: *See*—
Galvin, Aaron A., 4,051,467, Cl. 340-239.00S.

American Home Products Corporation (Del.): *See*—
Robinson, Charles A., 4,051,131, Cl. 544-28.000.

American Optical Corporation: *See*—
Andresen, Richard Paul, 4,051,482, Cl. 346-23.000.
Polanyi, Michael Lajos; and Ostrowski, David Stanley, 4,050,450, Cl. 128-2.00L.

Ameron, Inc.: *See*—
Wilms, Carl A., 4,050,585, Cl. 212-48.000.

Ames, Ronald B.: *See*—
Plant, Howard L.; Zukel, John W.; and Ames, Ronald B., 4,050,921, Cl. 71-94.000.

Ammon, J. Preston, to Elfab Corporation. Electrical connector. 4,050,769, Cl. 339-196.00M.

Amon, Anton; and Sedam, Jason K., to Coca-Cola Company, The. System for water disinfection. 4,051,034, Cl. 210-206.000.

AMP Incorporated: *See*—
Dola, Frank Peter, 4,051,383, Cl. 307-11.000.
Hopkins, John Root; Renn, Robert Maurice; and Southard, Robert Keith, 4,050,764, Cl. 339-103.00M.

Anahara, Meiji; and Fujita, Takayoshi, to Toyo Boseki Kabushiki Kaisha. Process and apparatus for measuring false twist in thermoplastic synthetic yarn. 4,050,225, Cl. 57-34.0HS.

Anders, Ronald J., to Rockwell International Corporation. Portable field machine for cutting, grinding and lapping valve seats. 4,050,836, Cl. 408-20.000.

Anderson, Arnold L.; and Nulph, Robert J., to Velsicol Chemical Corporation. Plastic compositions. 4,051,105, Cl. 260-45.95G.

Anderson Company, The: *See*—
Stratton, Donald W.; and Moorhead, John P., 4,050,832, Cl. 403-321.000.

Anderson, David Bowen: *See*—
Wilson, William Crawford; and Anderson, David Bowen, 4,050,725, Cl. 292-304.000.

Anderson, Dorothy M., executrix: *See*—
Anderson, Robert W., deceased; and Smith, Robert E., Jr., 4,051,324, Cl. 174-121.00R.

Anderson, Paul L.; and Nadelson, Jeffrey, to Sandoz, Inc. 1-(p-Alkanoylphenyl) alkanols and derivatives. 4,051,261, Cl. 424-331.000.

Anderson, Robert W., deceased (by Anderson, Dorothy M., executrix); and Smith, Robert E., Jr., to Haveg Industries, Inc. Radiation resistant cable and method of making same. 4,051,324, Cl. 174-121.00R.

Anderson Safeway Guard Rail Corporation: *See*—
Kelly, Daniel L., 4,051,525, Cl. 358-108.000.

Anderson, Thomas M. Articulated hull construction. 4,050,395, Cl. 114-77.00R.

Ando, Akiko: *See*—
Yanagisawa, Hiroaki; Ando, Akiko; Fukushima, Masami; and Nakao, Hideo, 4,051,320, Cl. 542-420.000.

Ando, Yujiro: *See*—
Tanaka, Keiji; Ando, Yujiro; and Ohara, Katsunobu, 4,050,802, Cl. 355-3.00R.

Andresen, Joh. H.: *See*—
Van Sluis, Jan Adolf; Reinhart, Frans Remko; Johansen, Johan Peter; and Pedersen, Rolf, 4,050,467, Cl. 131-147.00A.

Andresen, Richard Paul, to American Optical Corporation. Graticule with cursors. 4,051,482, Cl. 346-23.000.

Andrew, Herbert Francis; Stead, Cecil Vivian; and Thompson, Ronald, to Imperial Chemical Industries Limited. Phosphonophenylaminonaphthalene compounds. 4,051,175, Cl. 260-502.500.

Andrews, Jeffery Frederick; Chauhan, Harjinder Singh; and Bristow, Ian Trevor, to Eaton Corporation. Viscous shear fluid coupling. 4,050,559, Cl. 192-58.00B.

Andrews, Michael Joseph; Davis, William Allen; and Senske, Roger Alvin, to Boeing Company, The. Apparatus and method of measuring surface roughness. 4,050,294, Cl. 73-105.000.

Andrews, Peter: *See*—
Seubert, Jurgen; Pohlke, Rolf; Thomas, Herbert; and Andrews, Peter, 4,051,243, Cl. 424-250.000.

Angelucci, Joseph L.: *See*—
Angelucci, Thomas L.; and Angelucci, Joseph L., 4,050,618, Cl. 228-6.00A.

Angelucci, Thomas L.; and Angelucci, Joseph L. Flexible lead bonding apparatus. 4,050,618, Cl. 228-6.00A.

Anhegger, Sigmund; and Colell, Hans, to Dr. -Ing. H.c.F. Porsche Aktiengesellschaft. Closing apparatus for ventilation lines of fuel tanks in motor vehicles. 4,050,471, Cl. 137-39.000.

Annichiarico, Angelo V.: *See*—
Boschen, William O.; Annichiarico, Angelo V.; and Johnson, Arthur L., 4,051,035, Cl. 210-220.000.

Anshus, Byron E., to Chevron Research Company. Recovery of 2-pyrrolidone from dilute alkaline solutions. 4,050,994, Cl. 203-35.000.

Ansorge, Werner. Blocking circuit for thyristors. 4,051,384, Cl. 307-18.000.

Antonescu, Virgil: *See*—
Duca, Mihail; Vasiliu, Dan; Demetrescu, Teodor; Cimpoias, Ion; Linca, Ion; Breazu, Stefan; Antonescu, Virgil; and Cojocaru, Iosif, 4,050,704, Cl. 280-6.00R.

Anzur, Gregory C.: *See*—
Yant, Howard W.; Stinebiser, Karl W.; and Anzur, Gregory C., 4,050,985, Cl. 176-61.000.

Aqua-Chem, Inc.: *See*—
Craig, Glenn D.; Feuling, David T.; and LaHaye, Paul G., 4,050,877, Cl. 431-76.000.

Araki, Kenji: *See*—
Nakaoka, Kazuhide; Araki, Kenji; Iwase, Koji; Koike, Yasuo; and Fukunaka, Shiro, 4,050,959, Cl. 148-12.300.

Archer, Donald H.; McOwen, Sherwood A., Jr.; and Prickett, Robert J., to Raytheon Company. Parabolic horn antenna with microstrip feed. 4,051,476, Cl. 343-700.0MS.

Arenco Machine Company, Inc.: *See*—
Gorski, Dennis M.; Neuber, Dieter; and Wildmoser, Martin Michael, 4,050,579, Cl. 206-460.000.

Argo, Wesley B.; Edwards, James W.; Little, Albert P.; and Lumb, William M., to Monsanto Company. Catalyst preparation utilizing metal nitrates and nitrogen oxide scavenger. 4,051,070, Cl. 252-428.000.

Argus Chemical Corporation: *See*—
Lewis, Roger N., 4,051,167, Cl. 260-453.0RZ.
Lewis, Roger N.; Pastorino, Ronald L.; and Wilts, James F., 4,051,310, Cl. 526-230.000.

Ariga, Masao: *See*—
Ito, Yoshio; Ariga, Masao; and Suda, Masashi, 4,050,691, Cl. 271-124.000.
Ogawa, Hiroshi; and Ariga, Masao, 4,050,800, Cl. 355-75.000.

Armor, Anthony F.; and Winne, David H., to General Electric Company. End gas gap baffle structure for reverse flow cooled dynamoelectric machine. 4,051,400, Cl. 310-58.000.

Armstrong, Jack W., to Lipe-Rollway Corporation. Accumulator and feeder. 4,050,572, Cl. 198-347.000.

Armstrong, Lee R.: *See*—
Pettingell, James R.; and Armstrong, Lee R., 4,050,297, Cl. 73-117.200.

Arndt, Erhard; Brodmann, Nikolaus; and Roser, Horst R., to Hochtemperatur-Reaktorbau GmbH. Closed cycle gas coolant nuclear power plant. 4,050,984, Cl. 176-60.000.

Arneklev, Duane R.; Baker, Don R.; and Walker, Francis H., to Stauffer Chemical Company. N-(1,1 substituted propynyl)-α(3,5-substituted phenoxy) alkyl amides and their use as herbicides. 4,051,184, Cl. 260-559.00B.

Arnold, Dan M.; Paap, Hans J.; and Scott, Hubert D., to Texaco Inc. Method of measuring horizontal flow speed of fluids in earth formations penetrated by a wellborehole. 4,051,368, Cl. 250-270.000.

Arnold, Fred E.: *See*—
Helminiak, Thaddeus E.; and Arnold, Fred E., 4,051,108, Cl. 260-47.0CP.

Arnold, Wesley D., Jr., to United States of America, Energy Research and Development Administration. Method for separating mono- and di-octylphenyl phosphoric acid esters. 4,051,202, Cl. 260-990.000.

Aronoff, Elihu J.; and Dhami, Kewal Singh, to International Telephone and Telegraph Corporation. Curable compositions diallyl esters of dicarboxylic acids and fluoropolymers. 4,051,003, Cl. 204-159.170.

Arthur G. McKee & Company: *See*—
Greaves, Melvin J.; and Razgaitis, Frank V., 4,050,592, Cl. 214-18.200.

Artronix, Inc.: *See*—
Krippner, Kenneth E., 4,051,378, Cl. 250-421.000.
Zacher, Albert R., Jr., 4,051,379, Cl. 250-445.00T.

Asada, Eiichi, to Shoei Kagaku Kogyo Kabushiki Kaisha. Resistor composition and method for its manufacture. 4,051,074, Cl. 252-503.000.

Asahi Glass Company, Ltd.: *See*—
Gunjima, Tomoki; and Ichiki, Toshio, 4,051,002, Cl. 204-180.00P.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Koseki, Toshinori; Maeda, Kunio; Aboshi, Michihiro; and Kinoshita, Haruo, 4,051,096, Cl. 260-31.80M.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Kawasaki, Masahiro, 4,051,490, Cl. 354-24.000.
Uno, Nayuki; Shono, Tetsuji; Urano, Fumio; Kawasaki, Masahiro; and Miyata, Katsuhiko, 4,051,503, Cl. 354-289.000.

Asakura, Yasunori: *See—*
Fukuyama, Toshifumi; Asakura, Yasunori; and Onji, Norio, 4,051,365, Cl. 250-222.00R.

Asano, Toyohide; and Honda, Masahiro, to Ube Industries, Ltd. Apparatus for conveying products extruded out of an extruding press. 4,050,278, Cl. 72-257.000.

Asato, Goro, to American Cyanamid Company. 1-Benzoyl-3-(1,2,3,4-tetrahydro-4-oxo-1-naphthyl)-urea, a novel and useful intermediate for the preparation of animal growth promoting agents. 4,051,183, Cl. 260-553.00A.

Ashbrook, Clifford Logan. Beam balance weighing scale with self-aligning point contact support elements. 4,050,531, Cl. 177-198.000.

Askew, Herbert Frank: *See—*
Elliott, John Scotchford; Jayne, Gerald John Joseph; Askew, Herbert Frank; and Harrington, Colin John, 4,051,053, Cl. 252-78.300.

Aslund, Christer, to Granges NYBY AB. Method of producing dense metal tubes or the like. 4,050,143, Cl. 29-420.500.

Asper, William, to Raymond Lee Organization, Inc., The. Fly tie tool. 4,050,176, Cl. 43-1.000.

Aspro, Inc.: *See—*
Kraft, Derald H., 4,050,321, Cl. 74-230.800.

Atlantic Fluidics, Inc.: *See—*
Huse, Henry, 4,050,445, Cl. 126-271.000.

Atlantic Richfield Company: *See—*
Masologites, George P., 4,051,014, Cl. 208-88.000.
Myers, Gary A.; and Wunderlich, Donald K., 4,051,022, Cl. 208-253.000.

Atomic Energy of Canada Ltd.: *See—*
Prescott, John Fraser; and Sanford, Emerson Cecil, 4,051,185, Cl. 260-561.00R.

Audi NSU Auto Union Aktiengesellschaft: *See—*
Wieland, Werner, 4,050,132, Cl. 29-156.40R.

Auge, Bernard. Spectacle frames. 4,050,785, Cl. 351-120.000.

Ausatuft S.p.A.: *See—*
Frigo, Vito, 4,050,870, Cl. 425-317.000.

Aust, Walter Dean: *See—*
Still, Carl Otto; and Aust, Walter Dean, 4,050,992, Cl. 202-227.000.

Automation Steeg and Hoffmeyer GmbH: *See—*
Steeg, Emil; and Hoffmeyer, Uwe, 4,050,223, Cl. 53-381.00R.

Automobile Corporation of America: *See—*
Horwinski, Elwood R., 4,050,441, Cl. 126-121.000.

Automotive Products Limited: *See—*
Young, Alastair John, 4,050,552, Cl. 188-195.000.

Autotronic Controls Corporation: *See—*
Priegel, Jack C., 4,050,878, Cl. 431-90.000.

Avery International Corporation: *See—*
Richman, Edward B., 4,050,121, Cl. 24-73.0VA.

AVM Corporation: *See—*
Sheppard, William L., 4,050,472, Cl. 137-242.000.

Avon Products, Inc.: *See—*
Tsoucalas, Michael; Barclay, Kenneth W.; and Rogers, Jack M., 4,051,159, Cl. 260-404.500.

Awalt, Thomas Y., Jr. Supplemental heat and heat transfer subsystems for solar air conditioning systems. 4,050,626, Cl. 237-1.00A.

Azuma, Akira, to Yoshida Kogyo K.K. Knockdown apparatus for supporting and driving overhung doors. 4,050,191, Cl. 49-360.000.

B. F. Goodrich Company, The: *See—*
Holloway, John Ambrose, 4,051,111, Cl. 260-75.0NP.

B.W. Darrah, Inc.: *See—*
Draffone, A. Peter, 4,050,975, Cl. 156-217.000.

Babcock & Wilcox Company, The: *See—*
Heidt, Henry M., 4,051,227, Cl. 423-259.000.
McDonald, Bertrand N., 4,050,511, Cl. 165-162.000.

Babcock & Wilcox Limited: *See—*
Chapman, John Edward, 4,050,384, Cl. 104-138.00G.

Bachmann, Lothar; and Engemann, Karl-Heinz, to Veb Werkzeugmaschinenkombinat "7.Oktober. Index generation method and machine for production of bevel gears. 4,050,353, Cl. 90-5.000.

Badagnani, Guido; and Carioli, Giancarlo, to Ing. C. Olivetti & C., S.p.A. Arrangement for the remote switching-on and initialization of a data terminal. 4,051,326, Cl. 179-2.0DP.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Kissel, Ernst; Neumann, Eckart; Guenther, Ernst; Valentin, Guenter; and Hoerauf, Werner, 4,051,113, Cl. 260-78.00L.

Badische Maschinenfabrik GmbH: *See—*
Kemper, Gert; and Melzer, Roland, 4,050,505, Cl. 164-206.000.

Baghdady, Elie J.: *See—*
Pickett, Robert B.; and Baghdady, Elie J., 4,051,438, Cl. 325-45.000.

Bailey, Charles H.; and Dillon, James E., to UOP Inc. Combination muffler and catalytic converter. 4,050,903, Cl. 23-288.0FC.

Baird, William C., Jr.: *See—*
Bearden, Roby, Jr.; and Baird, William C., Jr., 4,051,015, Cl. 208-108.000.

Baker, Don R.; and Walker, Francis H., to Stauffer Chemical Company. N-benzyl-2-(3,5-dimethyl phenoxy)-2-alkoxy amide herbicides. 4,050,923, Cl. 71-118.000.

Baker, Don R.: *See—*
Arneklev, Duane R.; Baker, Don R.; and Walker, Francis H., 4,051,184, Cl. 260-559.00B.

Baker, William H. Two-in-one perimeter gutter for swimming pools. 4,050,104, Cl. 4-172.170.

Baldwin, John Lewis Edwin, to Independent Broadcasting Authority. Television systems. 4,051,531, Cl. 358-140.000.

Balevski, Angel Tonchev; Nikolov, Ivan Dimov; Nenov, Dragan Iliev; and Momchilov, Emil Nikolov, to Institute po Metaloznanie i Technologia na Metalite. Apparatus for controlling the rate of filling of casting molds. 4,050,503, Cl. 164-155.000.

Ball Brothers Research Corporation: *See—*
Murphy, Lawrence R.; and Sanford, Gary G., 4,051,477, Cl. 343-700.0MS.

Balsley, Richard L.: *See—*
Little, Harold A.; and Balsley, Richard L., 4,050,245, Cl. 60-313.000.

Barbieri, Siegfried, to Durst AG. Fabrik Fototechnischer Apparate Bozen. Process and device for copying photographic color images. 4,050,807, Cl. 355-32.000.

Barclay, Kenneth W.: *See—*
Tsoucalas, Michael; Barclay, Kenneth W.; and Rogers, Jack M., 4,051,159, Cl. 260-404.500.

Barden, Wayne A., to CTS Corporation. Variable resistance control with low noise contactor. 4,051,453, Cl. 338-171.000.

Barker, Bayetta, executrix: *See—*
Barker, Frank S., deceased; and Pehl, Willis G., 4,050,209, Cl. 52-478.000.

Barker, Frank S., deceased (Barker, Bayetta, executrix); and Pehl, Willis G., to Shakertown Corporation. Prefabricated shingle panels. 4,050,209, Cl. 52-478.000.

Barlow, Harold Everard Monteagle, to National Research Development Corporation. Waveguides. 4,051,450, Cl. 333-95.00R.

Barnett, George Henry, to ICI Australia Limited. Stabilized nitratoalkanol explosive composition. 4,050,970, Cl. 149-88.000.

Barnsbee, Clive D., to Eastman Kodak Company. Web stretching apparatus. 4,050,124, Cl. 26-73.000.

Barr, Dennis Arthur; and Rose, John Brewster, to Imperial Chemical Industries Limited. Aromatic polymers. 4,051,109, Cl. 260-49.000.

Barry, Robert J. Permanently implanted hair piece attaching means. 4,050,100, Cl. 3-1.000.

Bartner, Bernard I.: *See—*
Brumlik, George C.; and Bartner, Bernard I., 4,050,873, Cl. 425-371.000.

Barton, David W.; and Muller, George H., to Ford Motor Company. Pneumatic flexible bumper. 4,050,689, Cl. 293-71.00P.

BASF Aktiengesellschaft: *See—*
Hjortzberg, Bernhard A., 4,051,517, Cl. 358-15.000.
Koester, Eberhard; Wunsch, Gerd; Schoenafinger, Eduard; and Schneehage, Henning, 4,050,962, Cl. 148-105.000.
Simak, Petr; Herrle, Karl; Haaf, Franz; and Hatzmann, Guenter, 4,051,200, Cl. 260-899.000.
Wendel, Kurt; Reichel, Fritz; and Taubitz, Christof, 4,051,093, Cl. 260-29.6TA.

BASF Wyandotte Corporation: *See—*
Cenker, Moses; and Kan, Peter Tai-Yuen, 4,051,082, Cl. 260-2.5AR.
Schweickart, Albert John; Collins, Stephen Michael; and Bortak, John Joseph, 4,051,009, Cl. 204-279.000.

Basi, Jagtar S., to International Business Machines Corporation. Surface treatment of semiconductor substrates. 4,050,954, Cl. 134-2.000.

Basile, Jerry. Book net for crabs, lobsters, and the like. 4,050,182, Cl. 43-105.000.

Bassoff, Arthur B.: *See—*
Tersch, Richard W.; and Bassoff, Arthur B., 4,050,350, Cl. 90-1.60R.

Batina, Raymond T.: *See—*
Alleman, Raymond J.; Batina, Raymond T.; and Clark, Ralph J., 4,050,394, Cl. 113-120.00R.

Batzer, Othmer F.; and Stewart, John A., to International Minerals & Chemical Corporation. Settling clay-containing slimes. 4,051,027, Cl. 210-42.00R.

Baum, Joerg Peter, to Pennsylvania Engineering Corporation. Method and apparatus for handling off-gases from metal refining vessel. 4,050,682, Cl. 266-158.000.

Baumann, Hans D., to Masoneilan International, Inc. Fluid resistance device. 4,050,479, Cl. 138-42.000.

Baumeyer, Ute: *See—*
Benczur-Urmossy, Gabor; and Baumeyer, Ute, 4,051,305, Cl. 429-217.000.

Bausch & Lomb Incorporated: *See—*
Kreckel, Kurt H., 4,051,348, Cl. 219-506.000.
Morton, Roger R., 4,051,458, Cl. 340-146.3AG.

Bautz, Frederick H., to Continental Can Company, Inc. U.V. curing machine. 4,050,412, Cl. 118-642.000.

Baxter, Larry K., to QSI Systems, Inc. Sequential video switching system. 4,051,524, Cl. 358-108.000.

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Braden, Rudolf; Knupfer, Hans; and Ziemann, Heinz, 4,051,177, Cl. 260-510.000.
Friedrich, Adolf; Harnisch, Horst; and Raue, Roderich, 4,051,134, Cl. 544-217.000.
Grigat, Ernst; and Hetzel, Hartmut, 4,051,212, Cl. 264-102.000.
Hess, Bernhard; and Raichle, Karl, 4,051,085, Cl. 260-16.000.
Jabs, Gert; and Loew, Gunther, 4,051,081, Cl. 260-2.5AD.
Kuhlthau, Hans-Peter; and Beecken, Hermann, 4,051,084, Cl. 260-158.000.
Kuhlthau, Hans-Peter; and Beecken, Hermann, 4,051,117, Cl. 260-146.00R.
Mayer, Karl Heinrich; Petersen, Siegfried; Klauke, Erich; Hoffmeister, Friedrich; and Wuttke, Wolfgang, 4,051,252, Cl. 424-273.00P.

Raffel, Reiner; Ebeling, Wilfried; Nadolski, Klaus; and Schulte. Klaus, 4,050,896, Cl. 23-230.00A.
Wagner, Kuno; and Klinkmann, Kurt, 4,051,165, Cl. 260-453.0AB.
Wessling, Diether, 4,051,146, Cl. 260-314.500.

Bayerisches Leichtmetallwerk Graf Blucher von Wahlstatt KG: *See*—
Schober, Franz, 4,050,283, Cl. 72-344.000.

Bazhanov, Jury Mikhailovich: *See*—
Zaikovsky, Vladimir Borisovich; Kutuzov, Jury Prokhorovich; Zakharov, Mikhail Fedorovich; Kavtaev, Evgeny Emelyanovich; Poedinschikov, Jury Grigorievich; Bazhanov, Jury Mikhailovich; and Schapov, Valentin Andrianovich, 4,050,288, Cl. 72-468.000.

BBC Brown Boveri & Company Limited: *See*—
Beckershoff, Wolfgang, 4,050,850, Cl. 416-221.000.
Beriger, Conrad; and Keller, Eduard, 4,051,509, Cl. 357-82.000.
Del Matto, Antonio, 4,050,702, Cl. 277-148.000.
Eggmann, Jean; and Hartmann, Max, 4,050,660, Cl. 248-19.000.
Kloss, Albert, 4,051,545, Cl. 361-58.000.

Bean, Kenneth E.: *See*—
Smeltzer, Ronald K.; and Bean, Kenneth E., 4,050,979, Cl. 156-647.000.

Beard, Franklin: *See*—
Hereford, Judson A.; and Beard, Franklin, 4,050,854, Cl. 417-121.000.

Beard, James D.: *See*—
Stephens, Frederick N.; Rowlett, Glenford; and Beard, James D., 4,050,222, Cl. 53-381.00R.

Bearden, Roby, Jr.; and Baird, William C., Jr., to Exxon Research & Engineering Co. Hydroconversion of heavy hydrocarbons using copper chloride catalyst. 4,051,015, Cl. 208-108.000.

Beaty, William Ralph, Jr., to Continental Oil Company. Catalytic hydrocarbon reforming process and catalyst. 4,051,017, Cl. 208-135.000.

Beauhaire, Pierre, to Societe Anonyme dite: Compagnie Industrielle des Telecommunications Cit-Alcatel. Connector for optical fibers. 4,050,781, Cl. 350-96.00C.

Beck, Edward G., Jr., to Stolle Corporation, The. Removable hatch structure for automobiles. 4,050,200, Cl. 52-19.000.

Beckershoff, Wolfgang, to BBC Brown Boveri & Company Limited. Arrangement for locking parts into the rotor of a turbomachine. 4,050,850, Cl. 416-221.000.

Beckman Instruments, Inc.: *See*—
Neti, Radhakrishna Murty; and Roggenkamp, Ray Lawrence, 4,051,006, Cl. 204-195.00P.

Beckmann, Gunter: *See*—
Pfeiffer, Kurt; Dietrich, Johannes; Beckmann, Gunter; and Herkt, Karl-Heinz, 4,050,901, Cl. 23-285.000.

Becton, Dickinson and Company: *See*—
Rapoza, Edward J., 4,050,316, Cl. 73-425.600.
Williams, Joel L.; Tulis, Jerry J.; and Taylor, Larry A., 4,050,576, Cl. 206-210.000.

Bedford, Raymond E.; and Berg, Morris, to General Motors Corporation. Method for making pellet type catalyst. 4,051,072, Cl. 252-464.000.

Beecken, Hermann: *See*—
Kuhlthau, Hans-Peter; and Beecken, Hermann, 4,051,084, Cl. 260-158.000.
Kuhlthau, Hans-Peter; and Beecken, Hermann, 4,051,117, Cl. 260-146.00R.

Beffa, Fabio: *See*—
Ackermann, Hans; and Beffa, Fabio, 4,051,118, Cl. 260-153.000.

Beitzel, Stuart Wallace: *See*—
Harter, Joseph William; and Beitzel, Stuart Wallace, 4,051,043, Cl. 250-531.000.

Belart, Juan, to ITT Industries, Incorporated. Braking system having anti-skid control. 4,050,748, Cl. 303-114.000.

Belco Industries, Incorporated: *See*—
Kohn, Thomas F., 4,050,889, Cl. 432-130.000.

Bell & Howell Company: *See*—
Broderick, Milan A.; and Mateja, Eugene V., 4,050,810, Cl. 355-40.000.
Fleischman, Andor A., 4,050,778, Cl. 350-2.000.
Fleischman, Andor A., 4,050,779, Cl. 350-2.000.
Gross, Roger A.; Radloff, Marvin D.; and Gault, Donald D., 4,050,799, Cl. 353-74.000.

Bell Telephone Laboratories, Incorporated: *See*—
Cuthbert, John David; and Munro, David Farnham, 4,050,821, Cl. 356-156.000.
Fulton, Theodore Alan, 4,051,393, Cl. 307-306.000.
Krambeck, Robert Harold; Sequin, Carlo Heinrich; and Walden, Robert Henry, 4,051,505, Cl. 357-24.000.
Rode, Daniel Leon, 4,050,964, Cl. 148-171.000.

Benczur-Urmossy, Gabor; and Baumeyer, Ute, to Deutsche Automobilgesellschaft m.b.H. Electrodes for galvanic elements. 4,051,305, Cl. 429-217.000.

Bender, Frank N. Apparatus for angulating forks on a fork lift truck. 4,050,599, Cl. 214-730.000.

Bendix Corporation, The: *See*—
Aldrich, Francis William, 4,051,097, Cl. 260-38.000.
Kwolek, John P.; Urso, William G.; and Jones, Trevor D., 4,050,620, Cl. 228-162.000.
Tarr, Walter R., 4,050,619, Cl. 228-162.000.

Bendix Westinghouse Limited: *See*—
Knight, David John, 4,050,743, Cl. 303-22.00R.

Benedict, Richard S., to United Technologies Corporation. Relative compression of an internal combustion engine. 4,050,296, Cl. 73-116.000.

Beneke, Jene A.; and Bozich, George J., to Verson Allsteel Press Company. Two-speed transmission having enclosed flywheel. 4,050,557, Cl. 192-4.00R.

Benford, Arthur E., to Whirlpool Corporation. Method of making refrigeration apparatus enclosure structure. 4,050,145, Cl. 29-460.000.

Benjamin, Joseph Reginald. Drilling rigs. 4,050,590, Cl. 214-2.500.

Bennett, Joan E., legal representative: *See*—
McMullen, Willard C.; Gee, Samuel, Sr., deceased; Whitney, Patricia E., legal representative; and Bennett, Joan E., legal representative, 4,050,307, Cl. 73-337.000.

Benthin, Finn, to A/S Hotaco. Mixing device. 4,050,677, Cl. 366-11.000.

Berend, Wolfgang, to Saurer-Allma GmbH Allgauer Maschinenbau. Spindle having an underwind crown for ring spinning and ring twisting frames, especially for cord twisting frames. 4,050,227, Cl. 57-34.500.

Beres, Steve W., to VCA Corporation. Spray pump assembly. 4,050,860, Cl. 417-444.000.

Berg, Morris: *See*—
Bedford, Raymond E.; and Berg, Morris, 4,051,072, Cl. 252-464.000.

Berger, Abe. Polyimide containing silicones. 4,051,163, Cl. 260-448.20N.

Berger Industries, Inc.: *See*—
Berger, Sidney; Buda, Salvatore; and Weintraub, Burton, 4,050,722, Cl. 285-175.000.

Berger, Sidney; Buda, Salvatore; and Weintraub, Burton, to Berger Industries, Inc. Joint for conduit. 4,050,722, Cl. 285-175.000.

Berggren, L. John; Chin, Charles L. D.; and Reilly, Joseph R., to Monsanto Company. Method and apparatus for temperature conditioning parts. 4,050,887, Cl. 432-122.000.

Berghahn, Walter G.; and Weinstein, Jack, to Bristol-Myers Company. Liquid applicator. 4,050,826, Cl. 401-196.000.

Bergman, Lawrence A., to Lord Corporation. Drive coupling. 4,050,266, Cl. 64-14.000.

Beriger, Conrad; and Keller, Eduard, to BBC Brown Boveri & Company Limited. Apparatus for cooling electrical devices at different electrical potentials by means of a flowing medium. 4,051,509, Cl. 357-82.000.

Berlincourt, Don A., to Channel Products, Inc. Encapsulation to prevent fracture of piezoelectric high voltage mechanism. 4,051,396, Cl. 310-340.000.

Bernardo, Matthew: *See*—
Cretella, Salvatore J.; Bernardo, Matthew; and DeMusis, Ralph T., 4,050,133, Cl. 29-156.80B.

Bernier, Edgar R.: *See*—
Hayner, Paul F.; Eldridge, David G.; Bernier, Edgar R.; and Henderson, Richard B., 4,050,476, Cl. 137-625.620.

Berning, Keith E. Automobile mount for citizens band radios. 4,050,767, Cl. 339-135.000.

Bernstein, Donald J. Alteration-sensitive surface. 4,051,295, Cl. 428-288.000.

Bernstein, Seymour; Lenhard, Robert Herman; and Conrow, Ransom Brown, to American Cyanamid Company. Ureidophenylenebis(carbonylimino)dinaphthalenetrisulfonic acid compounds. 4,051,176, Cl. 260-506.000.

Bertschmann, Silvio; Koester, Waldemar; and Huber, Reinhold, to Friedrich Maurer Soehne, Firma. Expansion gap sealing device. 4,050,207, Cl. 52-396.000.

Beser, William; and Cole, Edwin R., to Upjohn Company, The. Apparatus and process. 4,051,211, Cl. 264-51.000.

Beucherie, Pierre, to European Atomic Energy Community (EURATOM). Apparatus for depositing thin layers of materials by reactive spraying in a high-frequency inductive plasma. 4,050,408, Cl. 118-49.100.

Bez, Ulrich, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Installation for the energy absorption of vehicles. 4,050,537, Cl. 180-91.000.

Bhargava, Rameshwar Nath; and Neumark, Gertrude F., to North American Philips Corporation. Gallium phosphide light emitting semiconductive materials. 4,051,061, Cl. 252-301.4P.

Biax-Werkzeuge K.G. Wezel & Co. Prazisionswerkzeug-Fabrik: *See*—
Lange, Klaus, 4,050,128, Cl. 407-59.000.

Biebuyck, Lawrence F.: *See*—
Hubbard, S. Eugene; and Biebuyck, Lawrence F., 4,050,201, Cl. 52-97.000.

Bienert, Walter B.; and Pravda, Milton F., to Dynatherm Corporation. Down-pumping heat pipes. 4,050,509, Cl. 165-45.000.

Biggs, Donald William; and Rayfield, Wilson Parker, to Burroughs Corporation. Method and apparatus for stuffing ribbons. 4,050,617, Cl. 226-1.000.

Billault, Michel, to Sofrance S.A. Device for assembling stacked annular filtering elements, under constant pressure. 4,051,037, Cl. 210-236.000.

Billings, Ronald Joseph: *See*—
Paulin, Robert Charles; and Billings, Ronald Joseph, 4,050,830, Cl. 403-205.000.

Binsbergen, Frederik L.; and Van Namen, Dick J., to Shell Oil Company. Lubricating oil compositions containing an acyclic polymer of cyclopentene. 4,051,051, Cl. 252-59.000.

Biorex Laboratories Limited: *See*—
Turner, John Cameron; and Chan, Rosalind Po-Kuen, 4,051,263, Cl. 424-347.000.

Birnholz, Jean; and Couty, Pierre. Unitary socket terminal for electronic circuits. 4,050,772, Cl. 339-220.00R.

Bishop, Robert J., to Allied Chemical Corporation. Inflation surge delay. 4,050,483, Cl. 141-4.000.

BJ-Hughes Inc.: *See—*
Gandy, Richard G.; and White, Vincent Cohee, 4,050,948, Cl. 106-76.000.
Giebeler, Bernhardt F., 4,050,512, Cl. 166-128.000.
Bjerk, Roger O.; Brandon, William D.; Engelking, Frederick S.; and Jero, John P., to Caterpillar Tractor Co. Fluoroelastomer-based composite material. 4,051,100, Cl. 260-42.180.
Blace Filtronics, Inc.: *See—*
Blace, Roy J., 4,051,033, Cl. 210-193.000.
Blace, Roy J., to Blace Filtronics, Inc. Filter device. 4,051,033, Cl. 210-193.000.
Black, Samuel J.: *See—*
Will, Albert S.; Wilson, Robert R.; and Black, Samuel J., 4,051,414, Cl. 361-415.000.
Black, Stephen Read, to Motorola, Inc. High speed ECL one-shot multivibrator. 4,051,387, Cl. 307-273.000.
Bland, Walter P.: *See—*
McKendry, Lennon H.; and Bland, Walter P., 4,051,130, Cl. 544-11.000.
Bloch, Peter K., to Krautkramer-Branson, Incorporated. Method and apparatus for testing railroad wheels. 4,050,292, Cl. 73-67.50R.
Blondet, Bruno; Kretschmer, Sylvain; Lacotte, Jean Pierre; and Peltier, Jean Paul, to Thomson-Brandt. An optical information recording system in which the energy when transmitted to the recording layer is constant. 4,051,329, Cl. 179-100.30N.
Bloomfield, Jordan J.; and Owsley, Dennis C., to Monsanto Company. Aroma chemicals. 4,051,076, Cl. 252-522.000.
Blount, David H. Process for the production of lignin silicate and lignin silicoformate. 4,051,115, Cl. 260-124.00R.
Bly, Vincent T., to United States of America, Army. Optical system for thermal imager. 4,051,370, Cl. 250-331.000.
Boccoli, Temistocle, to Piovanelli Macchinari e Impianti S.p.A. Method for reclaiming cured rubber scraps. 4,051,080, Cl. 260-2.300.
Boddicker, Major L.: *See—*
Shults, Otto C.; and Boddicker, Major L., 4,050,186, Cl. 46-180.000.
Bodem, Johann; and Raine, Thomas, to Schwarzkopf Development Corporation. Clamping tool holder. 4,050,127, Cl. 407-107.000.
Boeing Company, The: *See—*
Andrews, Michael Joseph; Davis, William Allen; and Senske, Roger Alvin, 4,050,294, Cl. 73-105.000.
Bogue, Robert Edgar; Jones, Donald Keith; Riggs, Ray Vere; and Vogele, Bruno Joseph, 4,050,655, Cl. 244-137.00R.
Pompei, Arturo; and Winters, Alden Bernard, 4,050,208, Cl. 52-460.000.
Syltebo, Bjarne Elroy, 4,050,631, Cl. 239-265.250.
Tieden, Jansey D., 4,051,394, Cl. 307-310.000.
Vanderleest, Siebold, 4,050,397, Cl. 114-274.000.
Bofors America, Inc.: *See—*
Reiters, Ludvigs O., 4,050,976, Cl. 156-233.000.
Bogaard, Johan J. H.; and Korteling, Gerrit-Jan, to U.S. Philips Corporation. Method of manufacturing a bulb for a cathode-ray tube, and bulb obtained by means of this method. 4,050,601, Cl. 220-2.10A.
Boggs, Roger L.: *See—*
Vanlandingham, Harold W.; Boggs, Roger L.; Bullock, David A.; and Maytum, James N., 4,050,141, Cl. 29-401.00R.
Boggs, William O. Visualizer. 4,050,798, Cl. 353-35.000.
Boggs, William O. Compact visualizer. 4,050,809, Cl. 353-35.000.
Bogue, Robert Edgar; Jones, Donald Keith; Riggs, Ray Vere; and Vogele, Bruno Joseph, to Boeing Company, The. Cargo loading method and apparatus. 4,050,655, Cl. 244-137.00R.
Boll, Bernd: *See—*
Metzinger, Wolfgang; Boll, Bernd; and Hergt, Peter, 4,050,846, Cl. 415-182.000.
Bolliand, Robert; and Saligny, Claude, to Rhone-Poulenc-Textile. Process and apparatus for continuously shrinking a non-woven sheet. 4,050,982, Cl. 162-100.000.
Bom, Cornelis Johannes Gerardus: *See—*
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 4,050,520, Cl. 172-59.000.
Bond, Desmond H.; Taggart, George W.; and Jaeger, Kurt S., to Ford, Bacon & Davis Texas, Inc. Production of internal atmospheres for kilns. 4,051,231, Cl. 423-659.000.
Bonin, Jean Claude, to Roto Diesel. Grinding head for machining constant internal profiles. 4,050,193, Cl. 51-101.00R.
Bonnerot, Georges, to Telecommunications Radioelectriques et Telephoniques T.R.T. Double odd discrete fourier transformer. 4,051,357, Cl. 364-726.000.
Bonnes, David R., to Union Fork & Hoe Company, The. Hand-shovel assembly and method of producing it. 4,050,727, Cl. 294-49.000.
Book, Nils Evert Erling, to Aktiebolaget Motala Verkstad. Apparatus for the hot-pressing of composite boards made from lignocellulosic material. 4,050,863, Cl. 425-84.000.
Bora, S.A., Firma: *See—*
Olsen, Niels Johan, 4,050,173, Cl. 38-143.000.
Borchardt, Jack A., to Environmental Filtration Products, Inc. Water treatment system. 4,051,032, Cl. 210-142.000.
Borck, Joachim: *See—*
Dahm, Johann; Borck, Joachim; Wild, Albrecht; and Hovy, Jan Willem, 4,051,250, Cl. 424-272.000.
Boren, John A., to North State Pyrophyllite Company. Refractory structure and method. 4,050,577, Cl. 206-322.000.
Borg, Karl S.; and Keith, Gareth A., to Masoneilan International, Inc. Variable force actuator. 4,050,670, Cl. 251-14.000.
Borgen, Jennings O. Method of reversible sterilization. 4,050,448, Cl. 128-1.00R.
Borisova, Natalya Isaakievna: *See—*
Lavrentiev, Konstantin Nikitich; Borisova, Natalya Isaakievna; Vasiliev, Jury Ivanovich; Rodionov, Jury Nikolaevich; Strashinsky, Vadim Konstantinovich; Ioffe, Vladimir Fedorovich; and Vyatskin, Iosif Yakovlevich, deceased, 4,051,422, Cl. 318-570.000.
Borrevang, Poul; and Petersen, Henning Borge, to Novo Industri A/S. Process for converting penicillin sulfoxides to the corresponding 3-desacetoxycephalosporins. 4,051,133, Cl. 544-18.000.
Borrill, James L., to International Harvester Company. Vehicle cab. 4,050,733, Cl. 296-28.00C.
Borrin, Jules. Method of reducing interliner remnant. 4,050,974, Cl. 156-159.000.
Borroughs Tool & Equipment Corporation: *See—*
Okamuro, James A., 4,050,139, Cl. 29-283.000.
Bortak, John Joseph: *See—*
Schweickart, Albert John; Collins, Stephen Michael; and Bortak, John Joseph, 4,051,009, Cl. 204-279.000.
Borup, Jorgen, to AB Nike Hydraulik. Method for vehicle alignment. 4,050,287, Cl. 72-457.000.
Bosch, Karl; and Fritzenschaft, Max, to Adolf Diener, Apparate- U. Maschinenbau. Air-hydraulic blind-riveting tool with short reset time. 4,050,285, Cl. 72-391.000.
Boschen, William O.; Annichiarico, Angelo V.; and Johnson, Arthur L., to Ralph B. Carter Company. Apparatus for the aerobic treatment of liquid waste. 4,051,035, Cl. 210-220.000.
Boschert Assoc.: *See—*
Boschert, Robert J., 4,051,445, Cl. 331-113.00A.
Boschert, Robert J., to Boschert Assoc. Inverter converter circuit for maintaining oscillations throughout extreme load variations. 4,051,445, Cl. 331-113.00A.
Bossak, Gary Edward: *See—*
Schuetz, Adolph August; and Bossak, Gary Edward, 4,051,375, Cl. 250-372.000.
Bosshart, John H.; and David, Emil J., to Eaton Yale Ltd. Articulated vehicle. 4,050,535, Cl. 180-51.000.
Bossi, Emilio: *See—*
Piccolo, Luigi; Calcagno, Benedetto; and Bossi, Emilio, 4,050,951, Cl. 106-300.000.
Botros, Raouf, to American Color & Chemical Corporation. Azomethine dyes derived from an o-hydroxy aromatic aldehyde and a 2-aminopyridine. 4,051,119, Cl. 260-156.000.
Bouley, Jean Claude, to Bunker Ramo Corporation. Method and apparatus for soldering electric terminals to double-sided circuit boards. 4,050,621, Cl. 228-180.00R.
Bourland, Joe D.: *See—*
Geddes, Leslie A.; and Bourland, Joe D., 4,051,539, Cl. 360-44.000.
Bourquardez, Gaston. Wind driven power system. 4,050,246, Cl. 60-398.000.
Bowing, Walter Grosse; Mrozek, Hinrich; Schlussler, Hans-Joachim; Tinnefeld, Bernd; and Vogele, Peter, to Henkel & Cie GmbH. Stable peroxy-containing microbicides. 4,051,058, Cl. 252-186.000.
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Boxboard Research and Development Association: *See—*
Luey, A. Thomas; and Hite, Frederick S., 4,050,499, Cl. 162-317.000.
Boyd, John A. Refuse treatment apparatus. 4,050,388, Cl. 110-8.00P.
Boyer, Jo Clara, to Saviano, A.G. Process for forming panty hose and an article formed thereby. 4,050,268, Cl. 66-19.000.
Bozich, George J.: *See—*
Beneke, Jene A.; and Bozich, George J., 4,050,557, Cl. 192-4.00R.
Braat, Josephus Johannes Maria, to U.S. Philips Corporation. Focus detection system for a video disc player using a plurality of radiation sensors in the far field of the information structure. 4,051,527, Cl. 358-128.000.
Brachert, Heinrich; and Kleiss, Joachim, to Dynamit Nobel Aktiengesellschaft. Process for the production of propellant charge powders, especially nitroguanidine powders. 4,051,207, Cl. 264-3.00B.
Braden, Rudolf; Knupfer, Hans; and Ziemann, Heinz, to Bayer Aktiengesellschaft. Process for the preparation of unsaturated amino compounds. 4,051,177, Cl. 260-510.000.
Brader, Allen C. Arch form component. 4,050,158, Cl. 32-14.00A.
Braemar Computer Devices, Inc.: *See—*
Martin, Peter G., 4,051,415, Cl. 318-7.000.
Brandon, Paul W.: *See—*
Takewell, Robert B.; Brandon, Paul W.; and Odom, Paul R., 4,050,869, Cl. 425-222.000.
Brandon, William D.: *See—*
Bjerk, Roger O.; Brandon, William D.; Engelking, Frederick S.; and Jero, John P., 4,051,100, Cl. 260-42.180.
Brandt, Arthur V. Centrifugal weights orienting system. 4,050,317, Cl. 74-64.000.
Braren, Rudolf. Cycloidal gears. 4,050,331, Cl. 74-804.000.
Bratchell, Robert Lyndon, to Concrete Industries (Monier) Limited. In-line moulding of prestressed concrete articles. 4,051,216, Cl. 264-157.000.
Brearley Company, The: *See—*
Provi, Mike A.; and Guinter, S. Robert, 4,050,532, Cl. 177-211.000.
Breazu, Stefan: *See—*
Duca, Mihail; Vasiliu, Dan; Demetrescu, Teodor; Cimpoias, Ion; Linca, Ion; Breazu, Stefan; Antonescu, Virgil; and Cojocaru, Iosif, 4,050,704, Cl. 280-6.00R.
Bredeweg, Roger L., to Dow Chemical Company, The. Method for

determining water vapor transmission rate or water content. 4,050,995, Cl. 204-1.00T.

Brewer, William E.; and Zimmer, Franklin V., to K-Krete, Inc. Method of building embankments and structure supports of backfilling. 4,050,258, Cl. 61-50.000.

Brewer, William E.; and Zimmer, Franklin V., to K-Krete, Inc. Method of backfilling. 4,050,261, Cl. 61-105.000.

Brewer, William E.; and Zimmer, Franklin V., to K-Krete, Inc. Controlled density fill material containing fly ash. 4,050,950, Cl. 106-97.000.

Bridgestone Tire Company Limited: *See—*
Wakana, Hiroshi; Harada, Isamu; and Honma, Tsutomu, 4,050,605, Cl. 220-5.00A.

Brigham Young University: *See—*
Strong, William James; and Palmer, Edward Paul, 4,051,331, Cl. 179-107.00R.

Bright, Clark I.: *See—*
Snyder, Jan S.; and Bright, Clark I., 4,051,463, Cl. 340-173.0TP.

Briles, Franklin S. Taper headed fastener to increase work fatigue life. 4,050,833, Cl. 403-405.000.

Brimhall, George H. Organic waste treating and conversion system. 4,050,907, Cl. 48-111.000.

Brinner, Thomas Richard; and Stitt, Thomas Deltor, to General Electric Company. Braking mode control for a chopper controlled d-c electric motor. 4,051,421, Cl. 318-367.000.

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Berghahn, Walter G.; and Weinstein, Jack, 4,050,826, Cl. 401-196.000.
Godfrey, John Carl; and Rubinfeld, Joseph, 4,051,315, Cl. 536-10.000.
Kawaguchi, Hiroshi; Tomita, Koji; Tsukiura, Hiroshi; and Konishi, Masataka, 4,051,237, Cl. 424-117.000.

Bristow, Ian Trevor: *See—*
Andrews, Jeffery Frederick; Chauhan, Harjinder Singh; and Bristow, Ian Trevor, 4,050,559, Cl. 192-58.00B.

British Petroleum Company Limited, The: *See—*
Southgate, Donald Alan, 4,050,955, Cl. 134-8.000.

Broderick, Milan A.; and Mateja, Eugene V., to Bell & Howell Company. Instantaneous imaging microfilm recording camera with blip control. 4,050,810, Cl. 355-40.000.

Brodmann, Nikolaus: *See—*
Arndt, Erhard; Brodmann, Nikolaus; and Roser, Horst R., 4,050,984, Cl. 176-60.000.

Brody, Philip S., to United States of America, Army. Ferroelectric ceramic devices. 4,051,465, Cl. 340-173.200.

Broggie, Roger E.: *See—*
Gurr, Robert H.; and Broggie, Roger E., 4,050,385, Cl. 104-173.0ST.

Broken Hill Associated Smelters Proprietary Limited, The: *See—*
Lawson, Frank; Waverley, Glen; Ward, Denby Harcourt; and Kelly, Robert George, 4,050,926, Cl. 75-78.000.

Bromfield, Ian Derek; and Seddon, Peter, to Nippon Kogaku K.K. Manufacture of multi-layer structures. 4,050,817, Cl. 355-133.000.

Brosh, Amnon: *See—*
Kurtz, Anthony D.; Mallon, Joseph R.; and Brosh, Amnon, 4,051,451, Cl. 338-42.000.

Brotzmann, Karl; and Fassbinder, Hans Georg, to Eisenwerk-Gesellschaft Maximilianshutte mbH. Apparatus for the controlled feeding of a refining gas and of a fluid protective medium. 4,050,681, Cl. 266-82.000.

Brovedan, Antonio: *See—*
Ferrentino, Antonio; Brovedan, Antonio; and Sala, Angelo, 4,050,867, Cl. 425-114.000.

Brown, Albert, to Raymond Lee Organization, Inc., The. Quarter card deck. 4,050,698, Cl. 273-152.410.

Brown, Alfred: *See—*
Wu, Ching H.; Brown, Alfred; Huang, Wann-Sheng; and Shum, Yick-Mow, 4,050,513, Cl. 166-274.000.

Brown, William E., to Dow Chemical Company, The. Ferrule and use thereof for cooling a melt spun hollow glass fiber as it emerges from a spinnerette. 4,050,915, Cl. 65-1.000.

Brozkova, Marie; Burysek, Frantisek; Janousek, Jan; Mikulecky, Karel; and Skoda, Stanislav, to Vyzkumny ustav bavlnarsky. Apparatus for timing a spinning-in operation of a textile machine. 4,050,226, Cl. 57-34.00R.

Brucken, Byron L.; and Watt, Roy E., to General Motors Corporation. Variable displacement radial piston compressor. 4,050,852, Cl. 417-273.000.

Bruckmann, Peter: *See—*
Geiger, Albert; and Bruckmann, Peter, 4,050,187, Cl. 47-45.000.

Brumlik, George C.; and Bartner, Bernard I. Train molding apparatus. 4,050,873, Cl. 425-371.000.

Brumm, Richard S., to Grove Valve and Regulator Company. Expansible tube valves. 4,050,669, Cl. 251-5.000.

Bruneau, Jacques: *See—*
Buzas, Andre; and Bruneau, Jacques, 4,051,259, Cl. 424-324.000.

Brunswick Corporation: *See—*
Mayer, William B., 4,050,359, Cl. 92-113.000.

Bryan, Hugh T. Fishing rod holder. 4,050,178, Cl. 43-212.000.

Bryand, Edward T., to Honeycomb Systems, Inc. Roll with inner and outer, spaced axially extending triangular mesh strips. 4,050,131, Cl. 29-121.300.

Buck, George Sumner, Jr.; Weyker, Robert George; and Ward, Arthur Gerard, to Fiberlok, Inc. Composite batt and method for producing same. 4,050,977, Cl. 156-283.000.

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Buckley, Bruce Shawn, to Massachusetts Institute of Technology. Controllable heat transmission panels. 4,050,508, Cl. 165-32.000.

Buda, Salvatore: *See—*
Berger, Sidney; Buda, Salvatore; and Weintraub, Burton, 4,050,722, Cl. 285-175.000.

Buell, Donald D. Dual spring clip for mounting electrical devices. 4,051,321, Cl. 174-57.000.

Bullock, David A.: *See—*
Vanlandingham, Harold W.; Boggs, Roger L.; Bullock, David A.; and Maytum, James N., 4,050,141, Cl. 29-401.00R.

Bullseye Glass Co.: *See—*
Ahlgren, Raymond E.; Schwoerer, Danial W.; and Lundstrom, Boyce H., 4,050,947, Cl. 106-52.000.

Bunas, Bennie I.; and Uitti, Kenneth D., to UOP Inc. Sieve-type fractionation trays. 4,051,206, Cl. 261-109.000.

Bundy, Gordon L.; and Nelson, Norman A., to Upjohn Company, The. Cis-4,5-didehydro-11-deoxy-13,14-dihydro-PG compounds. 4,051,160, Cl. 260-413.000.

Bunker Ramo Corporation: *See—*
Bouley, Jean Claude, 4,050,621, Cl. 228-180.00R.

Bunn, Dorrance P., Jr.; Williams, Dale; Jones, Henry B.; and MacLean, John P., to Texaco Inc. Fluidized catalytic cracking regeneration process. 4,051,069, Cl. 252-417.000.

Burchette, Robert L., Jr.; and Harris, Edward J., to Plastic Injectors, Inc. Yarn carrier. 4,050,645, Cl. 242-125.100.

Burchette, Robert L., Jr. Yarn carrier. 4,050,646, Cl. 242-125.100.

Burgbacher, Donald E.: *See—*
Hales, Louis S.; Hamilton, Don R.; Weller, Harry F.; and Burgbacher, Donald E., 4,050,198, Cl. 51-281.00R.

Burger, Peter: *See—*
Steranko, James Joseph; Rogoff, Gerardo; Scott, Randall Dean; Gallagher, Angela Frances; and Burger, Peter, 4,051,459, Cl. 364-900.000.

Burroughs Corporation: *See—*
Biggs, Donald William; and Rayfield, Wilson Parker, 4,050,617, Cl. 226-1.000.
Lawrie, Duncan H.; and Vora, Chandrakant Ratilal, 4,051,551, Cl. 364-200.000.

Burysek, Frantisek: *See—*
Brozkova, Marie; Burysek, Frantisek; Janousek, Jan; Mikulecky, Karel; and Skoda, Stanislav, 4,050,226, Cl. 57-34.00R.

Buse, Frederic W., to Ingersoll-Rand Company. Multi-plunger reciprocating pump. 4,050,862, Cl. 417-539.000.

Bussard, Leon M., to Bussard, Leon M.; and Smith, C. Ed. Boat trailer extension assembly. 4,050,595, Cl. 214-84.000.

Butler, John F., to Jones & Laughlin Steel Corporation. Method of measuring vapor deposited coating thickness. 4,051,270, Cl. 427-8.000.

Butler, Roy I.: *See—*
Lowe, John G.; and Butler, Roy I., 4,051,024, Cl. 210-30.00A.

Buzas, Andre; and Bruneau, Jacques, to Les Laboratoires Bruneau & Cie. Phenoxyacetic acid amide. 4,051,259, Cl. 424-324.000.

Byk Gulden Lomberg Chemische Fabrik GmbH: *See—*
Hein, Helmut; Hermann geb Gleissner, Rosmarie; and Schaefer, Hartmann, 4,051,253, Cl. 424-285.000.
Klemm, Kurt; and Langenscheid, Erhard, 4,051,242, Cl. 424-246.000.

Byrne, John C.: *See—*
Castellana, Frank S.; Byrne, John C.; and Huckaba, Charles E., 4,050,449, Cl. 128-2.00S.

C. Hager & Sons Hinge Manufacturing Company: *See—*
Peterson, Francis C., 4,050,189, Cl. 49-26.000.

C M Industries: *See—*
Krausz, Francois, 4,051,127, Cl. 260-239.30D.

C. van der Lely N. V.: *See—*
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 4,050,520, Cl. 172-59.000.

Calcagno, Benedetto: *See—*
Piccolo, Luigi; Calcagno, Benedetto; and Bossi, Emilio, 4,050,951, Cl. 106-300.000.

California Institute of Technology: *See—*
Dimotakis, Paul E.; and Lang, Daniel B., 4,051,433, Cl. 324-78.00R.

Call, Daniel D., to Cummins-Allison Corporation. Coin roll packaging system. 4,050,218, Cl. 53-167.000.

Cambron, Robert B.: *See—*
Powers, Harold C.; and Cambron, Robert B., 4,050,360, Cl. 92-127.000.

Camilleri, Thomas M. Flexible plank support unit. 4,050,695, Cl. 273-53.000.

Campbell, Bowen, to Campbell, Cromwell B. Grain dryer construction. 4,050,164, Cl. 34-182.000.

Campbell, Cromwell B.: *See—*
Campbell, Bowen, 4,050,164, Cl. 34-182.000.

Campbell, Donn V., to United States of America, Army. Radio receiver isolation system. 4,051,475, Cl. 343-180.000.

Campbell, Robert W.: *See—*
Scoggins, Lacey E.; and Campbell, Robert W., 4,051,087, Cl. 260-18.00N.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Dennison, Graeme N., 4,050,766, Cl. 339-117.00P.
Power, John M., 4,050,382, Cl. 102-16.000.

Canadian Patents & Development Limited: *See—*
Sarjeant, Walter J., 4,051,432, Cl. 324-72.500.

Canan Kabushiki Kaisha: *See*—
Ogawa, Hiroshi; and Ariga, Masao, 4,050,800, Cl. 355-75.000.
Candor, James T. Method and apparatus for removing liquid from liquid bearing material. 4,050,162, Cl. 34-1.000.
Canon Kabushiki Kaisha: *See*—
Ito, Yoshio; Ariga, Masao; and Suda, Masashi, 4,050,691, Cl. 271-124.000.
Komine, Yoshio, 4,050,796, Cl. 352-243.000.
Tanaka, Keiji; Ando, Yujiro; and Ohara, Katsunobu, 4,050,802, Cl. 355-3.00R.
Tanikoshi, Kinji, 4,051,420, Cl. 318-254.000.
Canon Seiki Kabushiki Kaisha: *See*—
Tanikoshi, Kinji, 4,051,420, Cl. 318-254.000.
Canron, Inc.: *See*—
Pearson, Eugene Walford, 4,050,338, Cl. 83-641.000.
Canterbury, Robert Houston, to Dresser Industries, Inc. Method of injecting fluids into underground formations. 4,050,516, Cl. 166-305.00R.
Cappel, Fred; Hastik, Walter; Fleming, Georg; and Hofmann, Pierre, to Dravo Corporation. Process of controlling Fe^{++} content of sintered iron ore. 4,050,924, Cl. 75-5.000.
Cardinal, Daniel E., Jr. Laying down of large sheets of film. 4,050,972, Cl. 156-71.000.
Carioli, Giancarlo: *See*—
Badagnani, Guido; and Carioli, Giancarlo, 4,051,326, Cl. 179-2.0DP.
Carl Hurth Maschinen- und Zahnradfabrik: *See*—
Schulz, Wolfgang, 4,050,543, Cl. 184-6.300.
Carl Still, Firma: *See*—
Lorenz, Kurt, 4,050,990, Cl. 201-5.000.
Still, Carl Otto; and Aust, Walter Dean, 4,050,992, Cl. 202-227.000.
Carl Zeiss Stiftung: *See*—
Rentschler, Waldemar; and Starp, Franz, 4,051,495, Cl. 354-152.000.
Carlo Erba, S.p.A.: *See*—
Ambrogi, Vittorio; Logemann, Willy; Parenti, Marc'Antonio; and Tommasini, Raffaele, 4,051,245, Cl. 424-250.000.
Carlson, Glenn R., to Rohm and Haas Company. 1-Aryl-4-pyridones. 4,051,142, Cl. 260-294.900.
Carlson, John A., to Conchemco, Incorporated. Bowstring changer cable fitting. 4,050,137, Cl. 29-235.000.
Carmichael, John Michael; Hill, James David; and West, Donald Lee, to International Business Machines Corporation. Electronic control for optimizing carrier turnaround in printing apparatus. 4,050,564, Cl. 197-1.00R.
Carnation Company: *See*—
Kramer, Norman C., 4,050,570, Cl. 198-398.000.
Carre, Jean-Jacques; and Muterel, Roland, to Societe Anonyme D.B.A. Hydraulic booster. 4,050,251, Cl. 60-550.000.
Carrier Corporation: *See*—
Watson, James J., Jr., 4,050,881, Cl. 432-5.000.
Carter, J. Warne, Jr.: *See*—
Carter, J. Warne, Sr.; and Carter, J. Warne, Jr., 4,050,357, Cl. 91-410.000.
Carter, J. Warne, Sr.; and Carter, J. Warne, Jr. Steam admission valve and variable clearance volume steam cylinder. 4,050,357, Cl. 91-410.000.
Cartwright, Dwayne L., to Holloway Farm Supply, Inc. Ground marking foam. 4,050,944, Cl. 106-19.000.
Casio Computer Co., Ltd.: *See*—
Hakata, Masayuki, 4,051,356, Cl. 235-310.000.
Casper, Richard R.; and Marander, Myron P., to Weyerhaeuser Company. Method of controlling monomer loss during the production of a fiber-thermoplastic matrix by in situ bulk polymerization. 4,051,214, Cl. 264-137.000.
Cassano, James R.: *See*—
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,050,688, Cl. 271-5.000.
Castaigne, Albert Rene Joseph, to Centre d'Etudes pour l'Industrie pharmaceutique. Thieno[3,2-c]pyridine derivatives. 4,051,141, Cl. 260-294.80C.
Castellana, Frank S.; Byrne, John C.; and Huckaba, Charles E., to Medical Products Development Corporation. Apparatus for exercising muscles of a female patient's pelvic diaphragm. 4,050,449, Cl. 128-2.00S.
Castillo, Horace T.; and Marriott, Henry J. L., to Concept, Inc. Radiotransparent electrode. 4,050,453, Cl. 128-2.06E.
Castrol Limited: *See*—
Elliott, John Scotchford; Jayne, Gerald John Joseph; Askew, Herbert Frank; and Harrington, Colin John, 4,051,053, Cl. 252-78.300.
Cataldo, Roy S., to General Motors Corporation. Constant pressure-temperature delayed combustion high compression ratio engine and method. 4,050,420, Cl. 123-30.00C.
Caterpillar Tractor Co.: *See*—
Bjerk, Roger O.; Brandon, William D.; Engelking, Frederick S.; and Jero, John P., 4,051,100, Cl. 260-42.180.
Molnar, John, 4,050,735, Cl. 296-102.000.
Powers, Harold C.; and Cambron, Robert B., 4,050,360, Cl. 92-127.000.
Vanlandingham, Harold W.; Boggs, Roger L.; Bullock, David A.; and Maytum, James N., 4,050,141, Cl. 29-401.00R.
Caunt, Anthony David; and Fortuin, Michael Stanley, to Imperial Chemical Industries Limited. Polymerization process. 4,051,307, Cl. 526-77.000.
CAV Limited: *See*—
Hollett, Reginald; and Potter, James Charles, 4,050,437, Cl. 123-139.0AC.
Cavitron Corporation: *See*—
Warrin, George E., 4,051,337, Cl. 200-61.850.
Celanese Corporation: *See*—
Kirshenbaum, Gerald S.; and Vogelfanger, Elliot A., 4,051,265, Cl. 426-107.000.
Celanese Polymer Specialties Company: *See*—
McWhorter, Wayne F., 4,051,195, Cl. 260-837.00R.
Cendak, Bruno, to Grandi Motori Trieste S.p.A. G.M.T. - Fiat, Ansaldo, C.R.D.A. Cylinder liner with internal cooling ducts for internal combustion reciprocating engines. 4,050,421, Cl. 123-41.720.
Cenker, Moses; and Kan, Peter Tai-Yuen, to BASF Wyandotte Corporation. Carbodiimide-isocyanurate foams modified with ethoxylated polyols. 4,051,082, Cl. 260-2.5AR.
Centre d'Etudes pour l'Industrie pharmaceutique: *See*—
Castaigne, Albert Rene Joseph, 4,051,141, Cl. 260-294.80C.
Centronics Data Computer Corporation: *See*—
Menhennett, Herbert E., 4,050,563, Cl. 197-1.00R.
Chan, Rosalind Po-Kuen: *See*—
Turner, John Cameron; and Chan, Rosalind Po-Kuen, 4,051,263, Cl. 424-347.000.
Channel Products, Inc.: *See*—
Berlincourt, Don A., 4,051,396, Cl. 310-340.000.
Chapman, John Edward, to Babcock & Wilcox Limited. Tube inspection and servicing apparatus. 4,050,384, Cl. 104-138.00G.
Charles E. Frosst & Co.: *See*—
Weinstock, Leonard M.; Tull, Roger J.; and Mulvey, Dennis M., 4,051,144, Cl. 260-307.0FA.
Chasanoff, Daniel; and Schneider, Myles Z. Dental appliance. 4,050,156, Cl. 32-2.000.
Chauhan, Harjinder Singh: *See*—
Andrews, Jeffery Frederick; Chauhan, Harjinder Singh; and Bristow, Ian Trevor, 4,050,559, Cl. 192-58.00B.
Check, Frank T., Jr., to Pitney-Bowes, Inc. Meter setting mechanism. 4,050,374, Cl. 101-91.000.
Chemetron Corporation: *See*—
Crompton, Charles E.; and Kazi, Abdulla M. Z., 4,051,064, Cl. 252-309.000.
Glanz, Ronald Paul, 4,050,829, Cl. 403-205.000.
Paulin, Robert Charles; and Billings, Ronald Joseph, 4,050,830, Cl. 403-205.000.
Chemische Werke Huls Aktiengesellschaft: *See*—
Pfeiffer, Kurt; Dietrich, Johannes; Beckmann, Gunter; and Herkt, Karl-Heinz, 4,050,901, Cl. 23-285.000.
Chenevard, Alexis; and Torres, Jean, to SAPAL Societe Anonyme des Plieuses Automatiques. Device for transferring products between moulds of a production machine and a table of a wrapping machine. 4,050,574, Cl. 198-458.000.
Chevron Research Company: *See*—
Anshus, Byron E., 4,050,994, Cl. 203-35.000.
Liston, Thomas V., 4,051,047, Cl. 252-33.000.
Chiari, Gervasio. Multi-component, spherical, assemblable toy. 4,050,184, Cl. 46-17.000.
Childress, Ray. Safety shield and temporary roof support. 4,050,259, Cl. 61-63.000.
Chin, Charles L. D.: *See*—
Berggren, L. John; Chin, Charles L. D.; and Reilly, Joseph R., 4,050,887, Cl. 432-122.000.
Ching, Larry K. W.; Coleman, Charles E.; and Uba, Toshio, to Gates Rubber Company, The. Battery plate pasting method and apparatus. 4,050,482, Cl. 141-1.100.
Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt: *See*—
Guczoghy, Lajos; Pfliegel, Todor; Puklics, Maria; Institoris, Laszlo; and Seres, Jeno, 4,051,156, Cl. 260-393.000.
Chisholm, Douglas S.; and Dawson, David H., to Dow Chemical Company, The. Centrifugal extrusion apparatus which heat plastifies material by mechanical shearing action. 4,050,874, Cl. 425-382.00R.
Chloride Group Limited: *See*—
Snook, James Chetwood, 4,051,304, Cl. 429-94.000.
Cho, Jin Sul. Ladies handbag and radio. 4,050,493, Cl. 150-35.000.
Cho, Nakwon, to Electro-Nucleonics, Inc. Valve seat cleaning mechanism. 4,050,473, Cl. 137-244.000.
Choate, William Clay, to Texas Instruments Incorporated. Fault-tolerant cell addressable array. 4,051,354, Cl. 235-312.000.
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, to Hoffmann-La Roche Inc. Alkynyloxy-phenyl derivatives. 4,051,319, Cl. 542-413.000.
Cholet, Jacques; and Layotte, Pierre-Claude, to Institut Francais du Petrole. Movable device for generating acoustic shear waves in the earth. 4,050,540, Cl. 181-114.000.
Christensen, Alton B.: *See*—
Ralston, Harold A.; and Christensen, Alton B., 4,050,522, Cl. 172-311.000.
Chromalloy American Corporation: *See*—
Poland, Robert L., 4,050,523, Cl. 172-311.000.
Chu, Joseph Y. C.: *See*—
Marsh, Dana G.; and Chu, Joseph Y. C., 4,050,937, Cl. 96-48.00R.
Marsh, Dana G.; and Chu, Joseph Y. C., 4,050,939, Cl. 96-88.000.
Chu, Richard C.; and Moran, Kevin P., to International Business Machines Corporation. Method for customizing nucleate boiling heat transfer from electronic units immersed in dielectric coolant. 4,050,507, Cl. 165-1.000.
Churia, John J., to Thomas & Betts Corporation. Connector for cou-

pling a ground conductor to the shield of a shielded conductor. 4,051,323, Cl. 174-78.000.

Ciba-Geigy AG: *See—*
Ackermann, Hans; and Beffa, Fabio, 4,051,118, Cl. 260-153.000.
Mayer, Fritz, 4,050,269, Cl. 68-5.00D.
Piller, Bernhard; Lenoir, John; Froehlich, Alfred; Stauner, Thomas; and Tschopp, Paul, 4,051,123, Cl. 260-178.000.

Ciba-Geigy Corporation: *See—*
Durr, Dieter; and von Orelli, Marcus, 4,051,258, Cl. 424-322.000.
Jaccard, Roland, 4,051,208, Cl. 264-5.000.
Oswald, Alexis A.; and Valint, Paul L., 4,051,240, Cl. 424-225.000.
Ramey, Chester E.; and Luzzi, John J., 4,051,102, Cl. 260-45.80N.
Ramey, Chester E.; and Luzzi, John J., 4,051,137, Cl. 260-268.0TR.
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Spivack, John D.; and Luzzi, John J., 4,051,104, Cl. 260-45.85B.
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Cimpoias, Ion: *See—*
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Clark, Ralph J.: *See—*
Alleman, Raymond J.; Batina, Raymond T.; and Clark, Ralph J., 4,050,394, Cl. 113-120.00R.

Clay, Carl D.: *See—*
Hughes, Raymond H.; and Clay, Carl D., 4,050,742, Cl. 302-66.000.

Clean Energy Corporation: *See—*
Cramer, Frank B., 4,050,904, Cl. 23-288.00E.

Cline, Carl F.: *See—*
Tanner, Lee Elliot; Ray, Ranjan; and Cline, Carl F., 4,050,931, Cl. 75-175.500.

Coca-Cola Company, The: *See—*
Amon, Anton; and Sedam, Jason K., 4,051,034, Cl. 210-206.000.

Cochran, Larry Allen, to RCA Corporation. Hue correction apparatus controlled by chrominance saturation. 4,051,510, Cl. 358-28.000.

Coggon, Philip: *See—*
Sanderson, Gary Warner; Hoefler, Andrew Charles; Graham, Harold Nathaniel; and Coggon, Philip, 4,051,264, Cl. 426-52.000.

Cohen, Lawrence S., to TRW Inc. Solderless electrical contact. 4,050,760, Cl. 339-97.00R.

Cohen, Noal; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Intermediates in the synthesis of vitamin E. 4,051,153, Cl. 260-345.500.

Cojocaru, Iosif: *See—*
Duca, Mihail; Vasiliu, Dan; Demetrescu, Teodor; Cimpoias, Ion; Linca, Ion; Breazu, Stefan; Antonescu, Virgil; and Cojocaru, Iosif, 4,050,704, Cl. 280-6.00R.

Cole, Edwin R.: *See—*
Beser, William; and Cole, Edwin R., 4,051,211, Cl. 264-51.000.

Cole, William A., to Unitron Industries Ltd. Hearing aid having adjustable directivity. 4,051,330, Cl. 179-107.0FD.

Colell, Hans: *See—*
Anhegger, Sigmund; and Colell, Hans, 4,050,471, Cl. 137-39.000.

Coleman, Charles E.: *See—*
Ching, Larry K. W.; Coleman, Charles E.; and Uba, Toshio, 4,050,482, Cl. 141-1.100.

Coleman, Ronald J., to Mott, Victor S.; Groetsch, Gilbert; Johnston, John R.; and Groetsch, Ewald, part interest to each. Door hanger device. 4,050,671, Cl. 254-7.00R.

Coleman, William E.: *See—*
Albertine, Herman, Jr.; Craycraft, Donald G.; and Coleman, William E., 4,051,408, Cl. 315-169.00R.

Coley, Charles L. Book ejection apparatus. 4,050,754, Cl. 312-319.000.

Colgate-Palmolive Company: *See—*
Schaar, Charles H., 4,050,463, Cl. 128-287.000.

Collins, George R.; and Large, William R., to General Motors Corporation. Control unit. 4,050,249, Cl. 60-290.000.

Collins, Stephen Michael: *See—*
Schweickart, Albert John; Collins, Stephen Michael; and Bortak, John Joseph, 4,051,009, Cl. 204-279.000.

Coltrinari, Enzo L., to Equity Mining Corporation. Sodium sulfide leach process. 4,051,220, Cl. 423-24.000.

Columbus, Richard Lewis, to Eastman Kodak Company. Blood collection and separation device. 4,050,451, Cl. 128-2.00F.

Combi Co., Ltd.: *See—*
Nakao, Shinroku; Ishii, Yoshiyasu; and Ishii, Kenshun, 4,050,103, Cl. 4-110.000.

Combustion Engineering, Inc.: *See—*
Schuetz, Adolph August; and Bossak, Gary Edward, 4,051,375, Cl. 250-372.000.

Commissariat a l'Energie Atomique: *See—*
Lemercier, Guy, 4,050,988, Cl. 176-87.000.

Commonwealth Oil Refining Co. Inc.: *See—*
McDonald, Gerald W. G., 4,051,020, Cl. 208-213.000.

Commonwealth Scientific and Industrial Research Organization: *See—*
de Bruin, Henderikus Johannes; and Warble, Charles Edward, 4,050,956, Cl. 148-6.000.

Communication Sciences Corporation: *See—*
Schomburg, Richard A., 4,051,333, Cl. 179-175.30R.

Compagnie Generale d'Electricite: *See—*
Tardy, Andre, 4,050,783, Cl. 350-96.00C.

Comptex, Inc.: *See—*
Higgins, David M., 4,050,219, Cl. 53-183.000.

Concept, Inc.: *See—*
Castillo, Horace T.; and Marriott, Henry J. L., 4,050,453, Cl. 128-2.06E.
Foltz, Carl L.; Troutner, Vernon H.; and Trott, Arthur F., 4,050,528, Cl. 173-163.000.

Conchemco, Incorporated: *See—*
Carlson, John A., 4,050,137, Cl. 29-235.000.

Concrete Industries (Monier) Limited: *See—*
Bratchell, Robert Lyndon, 4,051,216, Cl. 264-157.000.

Cone, Charles Earl: *See—*
Lichon, James F.; and Cone, Charles Earl, 4,051,361, Cl. 362-211.000.

Conger, Robert Arthur. Self-cleaning animal feeder. 4,050,415, Cl. 119-51.500.

Connett, Donald C., to Eaton Corporation. Control valve for variable displacement pump or motor. 4,050,247, Cl. 60-444.000.

Connolly, Douglas P.: *See—*
McCarroll, Alan F.; and Connolly, Douglas P., 4,050,801, Cl. 355-3.00R.

Conrad, Ulrich; and Niemeier, Gerd, to Daimler-Benz Aktiengesellschaft. Filter for liquids. 4,051,036, Cl. 210-232.000.

Conrow, Ransom Brown: *See—*
Bernstein, Seymour; Lenhard, Robert Herman; and Conrow, Ransom Brown, 4,051,176, Cl. 260-506.000.

Continental Can Company, Inc.: *See—*
Bautz, Frederick H., 4,050,412, Cl. 118-642.000.

Continental Gummi-Werke Aktiengesellschaft: *See—*
Pakur, Henryk; and Tiemann, Reinhard, 4,050,497, Cl. 152-361.0FP.

Continental Oil Company: *See—*
Beaty, William Ralph, Jr., 4,051,017, Cl. 208-135.000.

Control Concepts, Inc.: *See—*
Zeuner, Kenneth W.; and Jarman, Alonzo B., 4,050,596, Cl. 214-131.00A.

Cook Electric Company: *See—*
Scheithauer, Eric A., 4,051,546, Cl. 361-124.000.

Cooke, George Frederick: *See—*
Fairbairn, Geoffrey; Cooke, George Frederick; Winkworth, Reginald; and Koreki, Jan, 4,050,289, Cl. 73-1.00F.

Coone, Malcolm G.; Malone, Billy C.; and Holbert, Marvin Lee, Jr., to Lynes, Inc. Shifting apparatus. 4,050,731, Cl. 294-86.240.

Copal Company Limited: *See—*
Inoue, Nobuyoshi; and Saito, Toshihisa, 4,051,501, Cl. 354-239.000.
Yaguinuma, Jusuke, 4,050,232, Cl. 58-52.00R.

Corcoran, William J.: *See—*
Holzman, Allen L.; and Corcoran, William J., 4,050,243, Cl. 60-245.000.

Cornue, Robert L. Knee splint. 4,050,456, Cl. 128-88.000.

Corsette, Douglas F. Manual actuated dispensing pump. 4,050,613, Cl. 222-321.000.

Cosden Oil & Chemical Company: *See—*
Daniels, Calvin L., 4,050,993, Cl. 203-9.000.
Wiley, Donald F., 4,051,293, Cl. 428-213.000.

Cosgrove, James F.: *See—*
McCain, William B.; Cosgrove, James F.; and Zagorski, Edward J., 4,050,686, Cl. 270-54.000.

Courson, Richard B., to Almo Manifold & Tool Company. Spray bars for metal rolling. 4,050,633, Cl. 239-550.000.

Coussot, Gerard, to Thomson-CSF. Surface acoustic wave transmission device and method of manufacturing same. 4,051,448, Cl. 333-30.00R.

Couty, Pierre: *See—*
Birnholz, Jean; and Couty, Pierre, 4,050,772, Cl. 339-220.00R.

Cox, Robert C. Disassemblable ski clamping apparatus. 4,050,685, Cl. 269-296.000.

CPC International Inc.: *See—*
Laitar, Robert, 4,051,301, Cl. 428-404.000.

Crabtree, Roger A. Idle system blocking means. 4,050,436, Cl. 123-198.0DB.

Craft, Inc.: *See—*
Roy, Leo T., 4,050,117, Cl. 16-178.000.

Craig, Glenn D.; Feuling, David T.; and LaHaye, Paul G., to Aqua-Chem, Inc. Reduction of gaseous pollutants in combustion flue gas. 4,050,877, Cl. 431-76.000.

Cramer, Frank B., to Clean Energy Corporation. Solubilization and reaction of coal and like carbonaceous feedstocks to hydrocarbons and apparatus therefor. 4,050,904, Cl. 23-288.00E.

Craycraft, Donald G.: *See—*
Albertine, Herman, Jr.; Craycraft, Donald G.; and Coleman, William E., 4,051,408, Cl. 315-169.00R.

Craycraft, Donald Gregory, to NCR Corporation. Load and hold system for plasma charge transfer devices. 4,051,409, Cl. 315-169.0TV.

Cremers, Adrien Edgard Henri Julien; Maes, Andre Petrus Adolf; and Pleysier, Jozef Leonia, to Leuven Research & Development VZW. Recovery of silver from silver-containing solutions. 4,051,026, Cl. 210-38.00B.

Crescentini, Lamberto: *See—*
Wells, Rodney Lee; and Crescentini, Lamberto, 4,051,196, Cl. 260-857.0PG.

Cretella, Salvatore J.; Bernardo, Matthew; and DeMusis, Ralph T. Method of refurbishing turbine vanes and the like. 4,050,133, Cl. 29-156.80B.

Crompton, Charles E.; and Kazi, Abdulla M. Z., to Chemetron Corporation. Process for making colloidal sols of antimony pentoxide in polyhydroxy alcohols. 4,051,064, Cl. 252-309.000.

Crompton & Knowles Corporation: *See—*
Magill, Jacques R., 4,050,891, Cl. 8-2.50R.

Crosby, Philip Stephen: *See—*
Nelson, Larry A.; and Crosby, Philip Stephen, 4,051,440, Cl. 328-134.000.

Crown Zellerbach Corporation: *See—*
Schmidt, Fred L.; and Steffes, Frank J., 4,050,980, Cl. 162-24.000.
Crum, James Roy, to International Nickel Company, Inc., The. Corrosion-resistant matrix-strengthened alloy. 4,050,928, Cl. 75-124.000.
Crump, Leslie L.; and Italiano, Victor J., to NCR Corporation. Record media advancing mechanism. 4,050,569, Cl. 197-120.000.
CTS Corporation: *See—*
Barden, Wayne A., 4,051,453, Cl. 338-171.000.
Cuda, John: *See—*
Touchton, James J.; Cuda, John; and Sordello, Frank J., 4,051,423, Cl. 318-611.000.
Cullison, David A.: *See—*
Vogt, B. Richard; and Cullison, David A., 4,051,248, Cl. 424-267.000.
Culver, Paul L.: *See—*
Will, Albert S.; Wilson, Robert R.; and Culver, Paul L., 4,051,339, Cl. 200-153.00L.
Cummins-Allison Corporation: *See—*
Call, Daniel D., 4,050,218, Cl. 53-167.000.
Cunningham, Walter F. Color coded indexing system. 4,050,719, Cl. 283-36.000.
Curley, James H., to International Telephone and Telegraph Corporation. Zero insertion force connector. 4,050,758, Cl. 339-74.00R.
Curran, Adrian Charles Ward, to John Wyeth & Brother Limited. Pyridine grignard derivatives. 4,051,139, Cl. 260-290.0HL.
Currie, William Edgar: *See—*
Gasier, James Mills; and Currie, William Edgar, 4,050,286, Cl. 72-416.000.
Currier, Bob L.: *See—*
Healy, James W.; and Currier, Bob L., 4,051,522, Cl. 358-86.000.
Curry, William G.: *See—*
New, Gordon R. A.; and Curry, William G., 4,050,847, Cl. 416-132.00A.
Cushing, Vincent J. Electromagnetic water current meter with synthetic direction field. 4,050,301, Cl. 73-189.000.
Cuthbert, John David; and Munro, David Farnham, to Bell Telephone Laboratories, Incorporated. Linewidth measurement method and apparatus. 4,050,821, Cl. 356-156.000.
Cutler-Hammer, Inc.: *See—*
Hastings, Jerome K., 4,050,148, Cl. 29-764.000.
Luy, William R., 4,051,452, Cl. 338-51.000.
Cyclops Corporation: *See—*
Scott, Harley D., 4,050,204, Cl. 52-262.000.
D.E.J. International Research Company B.V.: *See—*
Jongeling, Herman, 4,051,267, Cl. 426-330.300.
Dahm, Johann; Borck, Joachim; Wild, Albrecht; and Hovy, Jan Willem, to Merck Patent Gesellschaft mit beschrankter Haftung. Antiinflammatory azole derivatives. 4,051,250, Cl. 424-272.000.
Daiichi Tanso Kogyo KK: *See—*
Takemura, Takeshi; Katoh, Yoshihisa; Kurita, Shigeyuki; Sasaki, Susumu; Funabiki, Kyohei; and Hatano, Keizo, 4,051,098, Cl. 260-38.000.
Daimler-Benz Aktiengesellschaft: *See—*
Conrad, Ulrich; and Niemeier, Gerd, 4,051,036, Cl. 210-232.000.
Forster, Hans-Joachim M.; and Eltze, Ulrich, 4,050,556, Cl. 192-4.00B.
Grossner, Horst; Liebold, Hans; and Wehnert, Jurgen, 4,050,550, Cl. 188-112.000.
Holzapfel, Immanuel, 4,050,238, Cl. 60-39.230.
Kopf, Wolfgang, 4,050,326, Cl. 74-492.000.
Zaiser, Wolfgang; and Diegelmann, Helmut, 4,050,329, Cl. 74-750.00R.
Dainichi-Nippon Cables, Ltd.: *See—*
Kato, Hirosi; and Fujita, Hideo, 4,051,078, Cl. 260-2.00A.
Dainippon Ink and Chemicals, Inc.: *See—*
Ishikawa, Noboru; Nakamura, Hidehisa; Maruyama, Kazuyoshi; and Shoji, Akio, 4,051,194, Cl. 260-836.000.
Dainippon Screen Seizo Kabushiki-Kaisha: *See—*
Hata, Kazuo; and Mitani, Sumio, 4,051,274, Cl. 427-172.000.
Dalal, Rustom H.: *See—*
Thomas, Richard E.; Florence, Robert T.; Dalal, Rustom H.; and Scheuer, Raymond I., 4,051,283, Cl. 428-29.000.
Daley, Thomas G. Object support with strapping means. 4,050,664, Cl. 248-346.000.
Dalzell, Haldean Cloyce: *See—*
Razdan, Raj Kumar; Dalzell, Haldean Cloyce; and Herlihy, Patricia, 4,051,152, Cl. 260-345.300.
Daniels, Calvin L., to Cosden Oil & Chemical Company. Distillation of readily polymerizable ethylenically unsaturated compounds. 4,050,993, Cl. 203-9.000.
Danis, Louis J., to Eaton Corporation. Heat transfer element. 4,050,250, Cl. 60-517.000.
Dannels, Bobby F.: *See—*
Shepard, Alvin F.; and Dannels, Bobby F., 4,051,189, Cl. 260-619.00A.
Danyo, Eugene. Liquor-floating device. 4,050,484, Cl. 141-34.000.
Darby, Spencer: *See—*
Slater, Charles A., Jr.; and Darby, Spencer, 4,051,360, Cl. 362-363.000.
Darbyshire, Kenneth: *See—*
Phillips, Reginald Andrew; and Darbyshire, Kenneth, 4,050,256, Cl. 61-45.00D.
David, Donald J.: *See—*
Hardy, Edgar E.; and David, Donald J., 4,050,895, Cl. 23-230.00R.
David, Emil J.: *See—*
Bosshart, John H.; and David, Emil J., 4,050,535, Cl. 180-51.000.
David, Nel E. Shoulder protector. 4,050,099, Cl. 2-46.000.
Davidse, Jan; and Koppe, Rudolf P., to U.S. Philips Corporation. Color television chroma keying signal generator. 4,051,520, Cl. 358-22.000.
Davidson, Glenn E. Second handle for attaching to a shovel or the like. 4,050,728, Cl. 294-58.000.
Davidson, Sidney Hayes, to Du Pont de Nemours, E. I., and Company. 2-Cyano-2-hydroxyiminoacetamides as plant disease control agents. 4,051,255, Cl. 424-289.000.
Davidson, Stacy D. Sanitary mouth-to-mouth shield. 4,050,457, Cl. 128-145.500.
Davies, Charles Bloor; and Davies, James Francis, to Lever Brothers Company. Detergent compositions. 4,051,054, Cl. 252-89.00R.
Davies, Dan L., to Koppers Company, Inc. Production of treated wood having easy penetrability. 4,051,282, Cl. 427-393.000.
Davies, James Francis: *See—*
Davies, Charles Bloor; and Davies, James Francis, 4,051,054, Cl. 252-89.00R.
Davies, Michael LaVar; Johnson, Richard Servern; Noker, Alvin John; and Wilde, Veldon Lawrence, to Sperry Rand Corporation. Stylus carriage drive. 4,050,568, Cl. 197-90.000.
Davis, Bryan Terence: *See—*
Elliott, John Scotchford; Davis, Bryan Terence; and Howlett, Richard Martin, 4,051,049, Cl. 252-51.50A.
Davis, Charles F., Jr.: *See—*
Javan, Ali; and Davis, Charles F., Jr., 4,051,462, Cl. 340-173.0LT.
Davis, Charles W.; Raufeisen, Robert; and Salzgeber, Daniel Edwin, to Stanadyne, Inc. Fuel injection pump and governor and timing control system therefor. 4,050,432, Cl. 123-139.0AQ.
Davis, Neil M.: *See—*
Lile, Derek L.; and Davis, Neil M., 4,051,437, Cl. 324-158.00R.
Davis, Robert, Jr., to Raymond Lee Organization, Inc., The. Zee wrench. 4,050,334, Cl. 81-119.000.
Davis, William Allen: *See—*
Andrews, Michael Joseph; Davis, William Allen; and Semke, Roger Alvin, 4,050,294, Cl. 73-105.000.
Dawans, Francois; and Goldenberg, Emmanuel, to Institut Francais du Petrole, des Carburants et Lubrifiants. Molybdenum and tungsten compounds, their manufacture and their use as catalysts in the stereospecific polymerization of unsaturated organic compounds. 4,051,172, Cl. 526-90.000.
Dawson, David H.: *See—*
Chisholm, Douglas S.; and Dawson, David H., 4,050,874, Cl. 425-382.00R.
De luxe General, Incorporated: *See—*
Gyori, Robert Paul; and Tullio, Thomas, 4,050,808, Cl. 355-38.000.
Deal, William L.: *See—*
Humberstone, John; Deal, William L.; and Edgington, Arthur E., 4,050,358, Cl. 92-103.00F.
de Boer, Jan; and Reinink, Jan, to U.S. Philips Corporation. Dry-shaving apparatus. 4,050,151, Cl. 30-34.100.
de Bruin, Henderikus Johannes; and Warble, Charles Edward, to Commonwealth Scientific and Industrial Research Organization; and Flinders University of South Australia, The. Chemical bonding of metals to ceramic materials. 4,050,956, Cl. 148-6.000.
de Claire, Robert B., to United States of America, Army. Anti-rotation lock for fastener bolt. 4,050,494, Cl. 151-49.000.
Deepwater Salvage, Inc.: *See—*
Wilson, Woodrow, Jr., 4,050,546, Cl. 187-12.000.
De France, Robert V., to Fargo Mfg. Company, Inc. Cup-shaped underground tap connector. 4,050,761, Cl. 339-97.00R.
DeFranza, Alfred: *See—*
Nowick, Chester R.; and DeFranza, Alfred, 4,050,885, Cl. 432-31.000.
Degremont: *See—*
Fiessinger, Francois Marie, 4,051,028, Cl. 210-47.000.
Deike, Robert F., to Foresight Industries. Post driving machine. 4,050,526, Cl. 173-27.000.
Deily, Fred H.: *See—*
Heilhecker, Joe K.; Lock, Everett H.; and Deily, Fred H., 4,051,456, Cl. 340-18.0LD.
Del Matto, Antonio, to BBC Brown Boveri & Company Limited. Segmented sealing structure. 4,050,702, Cl. 277-148.000.
DEMAG Aktiengesellschaft: *See—*
Flaig, Heinz, 4,050,710, Cl. 280-112.00A.
de Massacre, Guy, to Hutchinson-Mapa. Method of and apparatus for removing puncture-resistant tubes from tires. 4,050,144, Cl. 29-427.000.
Demetrescu, Teodor: *See—*
Duca, Mihail; Vasiliu, Dan; Demetrescu, Teodor; Cimpoias, Ion; Linca, Ion; Breazu, Stefan; Antonescu, Virgil; and Cojocaru, Iosif, 4,050,704, Cl. 280-6.00R.
Democh, Roger E., to Eastman Kodak Company. Method for reducing mottle in coating a support with a liquid coating composition. 4,051,278, Cl. 427-326.000.
DeMusis, Ralph T.: *See—*
Cretella, Salvatore J.; Bernardo, Matthew; and DeMusis, Ralph T., 4,050,133, Cl. 29-156.80B.
Dennison, Graeme N., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Corrosion-proof electrical connector assembly. 4,050,766, Cl. 339-117.00P.
Denzer, Richard E., to General Motors Corporation. Cambering device for cambering vehicle. 4,050,711, Cl. 280-278.000.
Denzer, Richard E.; Marsh, Gerald J.; and Shakespear, Horacio, to General Motors Corporation. Cambering device for cambering vehicle. 4,050,712, Cl. 280-278.000.
Desenfant, Andre L., to Societe d'Etudes Generales de Communica-

tions Industrielles et Civiles-Segic. Noise reducing screen. 4,050,538, Cl. 181-210.000.

DeToia, Vincent D., to Raymond Lee Organization, Inc., The, a part interest. Gyro foil. 4,050,652, Cl. 244-23.00C.

Detterbeck, Heinrich: *See—*
Rohrl, Franz; Ackermann, Josef; and Detterbeck, Heinrich, 4,051,347, Cl. 219-400.000.

Deutsch Gold-und Silber-Scheideanstalt: *See—*
Knorre, Helmut; Fischer, Joachim; and Pohl, Gerhard, 4,051,228, Cl. 423-268.000.

Deutsche Automobilgesellschaft m.b.H.: *See—*
Benczur-Urmossy, Gabor; and Baumeyer, Ute, 4,051,305, Cl. 429-217.000.

Dewey, C. Forbes, Jr.; and Hocker, Lon O., to Massachusetts Institute of Technology. Opto-acoustic spectroscopy employing amplitude and wavelength modulation. 4,051,371, Cl. 250-339.000.

Dhami, Kewal Singh: *See—*
Aronoff, Elihu J.; and Dhami, Kewal Singh, 4,051,003, Cl. 204-159.170.

Dichter, Michael: *See—*
Horowitz, Carl; Dichter, Michael; and Shah, Navinchandra Bhogilal, 4,051,090, Cl. 260-23.70M.

Dickinson, Bryan J.: *See—*
Kalyan, Jagdish C.; and Dickinson, Bryan J., 4,050,544, Cl. 184-6.600.

Dickinson, William H. C., to W. H. Dickinson Engineering Limited. Feeding cut tobacco. 4,050,741, Cl. 302-13.000.

Dictaphone Corporation: *See—*
Wilder, Leslie N.; Whitney, James C.; and Matison, Gary, 4,051,540, Cl. 360-72.000.

Diegelmann, Helmut: *See—*
Zaiser, Wolfgang; and Diegelmann, Helmut, 4,050,329, Cl. 74-750.00R.

Diehl, Francis Louvaine; and Edwards, James Byrd, to Procter & Gamble Company, The. Detergent compositions containing insoluble particulate materials having fabric conditioning properties. 4,051,046, Cl. 252-8.600.

Diesel Kiki Co., Ltd.: *See—*
Kobayashi, Masayoshi; and Yuzawa, Yasutaka, 4,050,856, Cl. 417-289.000.

Dietrich, Johannes: *See—*
Pfeiffer, Kurt; Dietrich, Johannes; Beckmann, Gunter; and Herkt, Karl-Heinz, 4,050,901, Cl. 23-285.000.

Dillon, James E.: *See—*
Bailey, Charles H.; and Dillon, James E., 4,050,903, Cl. 23-288.0FC.

Dillon, Thomas J., to Thomas J. Dillon & Co., Inc. Method of erecting a multi-story building. 4,050,213, Cl. 52-743.000.

Dimotakis, Paul E.; and Lang, Daniel B., to California Institute of Technology. Signal responsive burst period timer and counter for laser doppler velocimetry and the like. 4,051,433, Cl. 324-78.00R.

Dingwall, Andrew Gordon Francis: *See—*
Rosenthal, Bruce David; and Dingwall, Andrew Gordon Francis, 4,051,392, Cl. 307-297.000.

Director-General of the Agency of Industrial Science and Technology: *See—*
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Dixon, Jimmie D.: *See—*
McCannon, Ralph C.; and Dixon, Jimmie D., 4,050,659, Cl. 248-19.000.

Doane, William M.: *See—*
Wing, Robert E.; and Doane, William M., 4,051,316, Cl. 536-107.000.

Dobashi, Toshio: *See—*
Nakagawa, Sadao; Tsukamoto, Masaaki; and Dobashi, Toshio, 4,051,493, Cl. 354-126.000.

Dockerty, Robert Charles: *See—*
Abbas, Shakir Ahmed; and Dockerty, Robert Charles, 4,051,273, Cl. 427-86.000.

Dr. -Ing. H.c.F. Porsche Aktiengesellschaft: *See—*
Anhegger, Sigmund; and Colell, Hans, 4,050,471, Cl. 137-39.000.
Bez, Ulrich, 4,050,537, Cl. 180-91.000.
Muller, Robert, 4,050,558, Cl. 192-53.00G.

Dr. Kurt Herberts & Co. Gesellschaft mit Beschrankter Haftung Vorm. Otto Louis Herberts: *See—*
Patzschke, Hans-Peter, 4,051,198, Cl. 260-879.000.

Doi, Yoshio, to Toyoda Koki Kabushiki Kaisha. Apparatus for forming grooved wheels. 4,050,274, Cl. 72-82.000.

Dola, Frank Peter, to AMP Incorporated. Electrical harnesses and connecting devices therefor. 4,051,383, Cl. 307-11.000.

Dolamore, Peter William. Reflective device. 4,050,444, Cl. 126-271.000.

Dolza, Claudio. Pipe laying machines. 4,050,589, Cl. 214-1.0PA.

Domroski, Raymond J. Batting practice kit. 4,050,694, Cl. 273-26.00E.

Donnelly, Gerard J. Dust pan-push broom apparatus. 4,050,110, Cl. 15-105.000.

Dore, Jacky, to Sandoz Ltd. Assymmetrical 1:2 cobalt complexes of metallizable monoazo compounds having one sulfo group per complex. 4,051,116, Cl. 260-145.00A.

Dorgnon, Roger, to Olin Corporation. Expansible nail like plug. 4,050,344, Cl. 85-68.000.

Doubleday, Eric George: *See—*
Wright, Gordon Thomas; and Doubleday, Eric George, 4,050,113, Cl. 15-315.000.

Dow Chemical Company, The: *See—*
Bredeweg, Roger L., 4,050,995, Cl. 204-1.00T.
Brown, William E., 4,050,915, Cl. 65-1.000.
Chisholm, Douglas S.; and Dawson, David H., 4,050,874, Cl. 425-382.00R.
Markley, Lowell D., 4,050,922, Cl. 71-106.000.
McKendry, Lennon H.; and Bland, Walter P., 4,051,130, Cl. 544-11.000.
Smith, Hubert Stacy, 4,050,607, Cl. 220-9.0LG.

Downs Surgical Limited: *See—*
Hall, John Emmett, 4,050,464, Cl. 128-303.00R.

Drabek, Rudolf: *See—*
Steinkopf, Wolfgang Otto Gotthard; and Drabek, Rudolf, 4,051,526, Cl. 358-127.000.

Draffone, A. Peter, to B.W. Darrah, Inc. O-ring splicing fixture. 4,050,975, Cl. 156-217.000.

Dragerwerk Aktiengesellschaft: *See—*
Frankenberger, Horst, 4,050,823, Cl. 356-186.000.

Dravo Corporation: *See—*
Cappel, Fred; Hastik, Walter; Fleming, Georg; and Hofmann, Pierre, 4,050,924, Cl. 75-5.000.
Heaney, Donald F., 4,051,039, Cl. 210-274.000.

Drennen, Thomas G.; and Neander, Allen, to United States of America, Navy. Force-displacement controller knob. 4,050,265, Cl. 64-11.00R.

Dresser Industries, Inc.: *See—*
Canterbury, Robert Houston, 4,050,516, Cl. 166-305.00R.

Drexhage, Karl Heinz; and Lamberts, Robert Lewis, to Eastman Kodak Company. Imaging device having improved blue response. 4,051,374, Cl. 250-370.000.

Drostholm, Frede Hilmar; Jensen, Harry; and Willadsen, Per, to Drostholm, Frede Hilmar. Brick press and associated equipment for making bricks. 4,050,865, Cl. 425-183.000.

DuBell, Thomas L., to General Electric Company. Stabilizing dimple for combustion liner cooling slot. 4,050,241, Cl. 60-39.660.

DuBois, Edmund H., to Outboard Marine Corporation. Unitary bushing and retainer assembly. 4,050,831, Cl. 403-243.000.

Duca, Mihail; Vasiliu, Dan; Demetrescu, Teodor; Cimpoias, Ion; Linca, Ion; Breazu, Stefan; Antonescu, Virgil; and Cojocaru, Iosif, to Institutul de Cercetari si Proiectari de Masini Agricole-ICPMA. Device for maintaining an upright position of the body of a harvester-thresher machines. 4,050,704, Cl. 280-6.00R.

Duchenaud, Alain; and Duchenaud, Roger. Cylinder for reproducing raised patterns on all surfaces. 4,050,409, Cl. 118-406.000.

Duchenaud, Roger: *See—*
Duchenaud, Alain; and Duchenaud, Roger, 4,050,409, Cl. 118-406.000.

Duclaux, Daniel; Pontier, Andre J. A.; and Ferret, Georges Paul, to Aluminum Pechiney. Process and apparatus for collecting the fumes given off during the production of aluminium in an electrolysis cell with a continuous anode. 4,051,224, Cl. 423-210.000.

Duesterhoeft, William C.; and McClain, James E., to Esco Manufacturing Company. Underwater cable connector assembly. 4,050,765, Cl. 339-117.00R.

Dukich, Peter P.; Metzger, Isaac W.; and Volk, John A., to Honeywell Inc. Head attached television. 4,051,534, Cl. 358-210.000.

Dulux Australia Ltd.: *See—*
Gibson, David Vincent, 4,051,088, Cl. 260-20.000.

Dunlap, Clifford E., to W. A. Krueger Co. Stacking apparatus and method. 4,050,591, Cl. 214-6.00D.

Dunlop Limited: *See—*
Moring, Peter Lothar Ernst, 4,050,322, Cl. 74-231.00J.

Dunnigan, Daniel Ambrose, to Abbott Laboratories. Manufacture of 3-arylpropyl chloride. 4,051,190, Cl. 260-651.00R.

Dupasquier, Joseph H. Composite elongated steam chamber. 4,050,630, Cl. 239-121.000.

Du Pont de Nemours, E. I., and Company: *See—*
Davidson, Sidney Hayes, 4,051,255, Cl. 424-289.000.
Feiring, Andrew Edward, 4,051,168, Cl. 260-456.00R.
Hasircoglu, Alexander William, 4,050,755, Cl. 339-17.0CF.
Moore, Earl Phillip, Jr., 4,051,124, Cl. 260-192.000.
Nacci, George Raymond, 4,050,942, Cl. 96-115.00R.
Pazos, Jose Francisco, 4,050,941, Cl. 96-115.00P.
Proskow, Stephen, 4,051,161, Cl. 260-448.80R.
Wallenberger, Frederick Theodore, 4,051,210, Cl. 264-45.400.

Dupre, Victor Marie; Pechmeze, Jacques Pierre Edmond; and Sureau, Robert Frederic Michel, to Produits Chimiques Ugine Kuhlmann. Fluorinated indazole derivatives and a process for their preparation. 4,051,145, Cl. 548-372.000.

Durling, Harold, to Midland-Ross Corporation. Inversion brake valve and system therefor. 4,050,746, Cl. 303-40.000.

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Pramstraller, Wilmuth, 4,050,813, Cl. 355-67.000.

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Pramstraller, Wilmuth, 4,050,815, Cl. 355-75.000.

Dusa, Donald J., to General Electric Company. Multiple bypass-duct turbofan with annular flow plug nozzle and method of operating same. 4,050,242, Cl. 60-204.000.

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Dykstra, Donald P., to Portable Laboratories, Inc. Modular laboratory cabinets adjustable in elevation. 4,050,752, Cl. 312-243.000.

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Dynapol: *See—*
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Dynatherm Corporation: *See—*
Bienert, Walter B.; and Pravda, Milton F., 4,050,509, Cl. 165-45.000.
E. R. Squibb & Sons, Inc.: *See—*
Harris, Don Navarro; Phillips, Marie B.; and Goldenberg, Harold Jacob, 4,051,236, Cl. 424-101.000.
Vogt, B. Richard; and Cullison, David A., 4,051,248, Cl. 424-267.000.
Wade, Peter C.; and Vogt, Berthold Richard, 4,051,246, Cl. 424-258.000.
Eagle Picher Industries, Inc.: *See—*
Jurasek, Stanley J., 4,050,606, Cl. 220-7.000.
Eakes, Marion L., to Marion L. Eakes Co. Ventilating system for industrial machines. 4,050,367, Cl. 98-115.0LH.
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Eastman Kodak Company: *See—*
Barnsbee, Clive D., 4,050,124, Cl. 26-73.000.
Columbus, Richard Lewis, 4,050,451, Cl. 128-2.00F.
Democh, Roger E., 4,051,278, Cl. 427-326.000.
Drexhage, Karl Heinz; and Lamberts, Robert Lewis, 4,051,374, Cl. 250-370.000.
Goffe, Charles A., deceased; Rand, Royden N.; and Wu, Tai W., 4,050,898, Cl. 23-253.0TP.
Hage, Charles Thomas, 4,050,805, Cl. 355-14.000.
Harvey, Donald Malcolm, 4,051,497, Cl. 354-231.000.
Metzger, Lenard M.; and Hickok, William Kelsey, 4,051,515, Cl. 358-8.000.
Smith, Wendell F., Jr; and Reynolds, George A., 4,050,938, Cl. 96-84.00R.
Wilson, William Crawford; and Anderson, David Bowen, 4,050,725, Cl. 292-304.000.
Eaton Corporation: *See—*
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Connett, Donald C., 4,050,247, Cl. 60-444.000.
Danis, Louis J., 4,050,250, Cl. 60-517.000.
Morgan, David F., 4,050,474, Cl. 137-596.000.
Nelson, Robert K.; and Mueller, James F., 4,050,534, Cl. 180-24.090.
Romick, Rowland C., 4,050,328, Cl. 74-711.000.
Schlegel, Fred, 4,050,275, Cl. 72-92.000.
Steinbacher, Jack T., 4,050,500, Cl. 164-16.000.
Zunkel, Richard L., 4,050,114, Cl. 16-48.500.
Eaton, Milton. Electrode tip for high voltage electrodes of the type utilized in high voltage boilers. 4,051,345, Cl. 219-288.000.
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Bosshart, John H.; and David, Emil J., 4,050,535, Cl. 180-51.000.
Whitcomb, Paul H., 4,050,486, Cl. 144-2.00Z.
Ebeling, Wilfried: *See—*
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Eberle, William J., to General Battery Corporation. Method of fusing a metal battery terminal post with a metal bushing. 4,050,501, Cl. 164-68.000.
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Ebner, Peter R.; and Griffith, Louis E., to Itek Corporation. Digital flash intensity control system for phototypesetters. 4,051,486, Cl. 354-7.000.
Eckert, Robert L. Mandrel and clip magazine for clip dispenser and applicator. 4,050,578, Cl. 206-340.000.
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Sylvester, John L., 4,050,634, Cl. 239-601.000.
Econo Fuel Systems, Inc.: *See—*
Harpman, Webster B.; and Mahoney, Fred G., 4,050,419, Cl. 123-3.000.
Eda, Tadahiro: *See—*
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Steranko, James Joseph; Rogoff, Gerardo; Scott, Randall Dean; Gallagher, Angela Frances; and Burger, Peter, 4,051,459, Cl. 364-900.000.
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Edwin Cooper and Company Limited: *See—*
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Eggmann, Jean; and Hartmann, Max, to BBC Brown Boveri & Company Limited. Casing support for horizontal-axis casings expanding in operation. 4,050,660, Cl. 248-19.000.
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Ehas, Stephan J.: *See—*
Webb, William E.; and Ehas, Stephan J., 4,050,566, Cl. 197-19.000.
Eichelberger, Edward Baxter; Muehldorf, Eugene Igor; Walther, Ronald Gene; and Williams, Thomas Walter, to International Business Machines Corporation. Level sensitive embedded array logic system. 4,051,352, Cl. 364-716.000.
Eirich, Gustav: *See—*
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Eirich, Wilhelm; and Eirich, Gustav. Pulverizing apparatus with a toothed disc. 4,050,637, Cl. 241-56.000.
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Kuwana, Noriaki; Hasegawa, Yoshikazu; and Nozu, Yukio, 4,050,989, Cl. 195-29.000.
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Brotzmann, Karl; and Fassbinder, Hans Georg, 4,050,681, Cl. 266-82.000.
Ekholm, Carl Roger, to Williams Manufacturing Company. Chiropractic table. 4,050,454, Cl. 128-70.000.
Eldridge, David G.: *See—*
Hayner, Paul F.; Eldridge, David G.; Bernier, Edgar R.; and Henderson, Richard B., 4,050,476, Cl. 137-625.620.
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Elfab Corporation: *See—*
Ammon, J. Preston, 4,050,769, Cl. 339-196.00M.
Ellington, Donal G.: *See—*
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Elliott, John Scotchford; Davis, Bryan Terence; and Howlett, Richard Martin, to Edwin Cooper and Company Limited. Lubricating oil containing alkanoic amide or ester-bridged hydrocarbyl substituted phenols. 4,051,049, Cl. 252-51.50A.
Elliott, John Scotchford; Jayne, Gerald John Joseph; Askew, Herbert Frank; and Harrington, Colin John, to Castrol Limited. Hydraulic fluids comprising orthosilicate esters. 4,051,053, Cl. 252-78.300.
Elliott, Richard Montgomery; and Newton, Albert Eugene, to USM Corporation. Hot melt dispenser body. 4,050,890, Cl. 432-210.000.
Elliott, Robert L.; and Gardiner, J. Brooke, to Exxon Research & Engineering Co. Oil-soluble hydrolyzed anionic-graft polymer of ethylene-propylene copolymer and anionically polymerizable nitrile monomer and derivatives thereof having utility as multifunctional V. I. improver for lubricating oils. 4,051,048, Cl. 252-51.50R.
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Ellis, Robert P. Cat and dog combination stretcher and scratcher. 4,050,417, Cl. 119-156.000.
Ellithorpe, Ernest Ralph; and Ellithorpe, Richard Calvin. Method of and apparatus for melting block sulphur. 4,050,740, Cl. 299-6.000.
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Ellithorpe, Ernest Ralph; and Ellithorpe, Richard Calvin, 4,050,740, Cl. 299-6.000.
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Epp, Walter H. Trailer hitch attachment. 4,050,714, Cl. 280-495.000.
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Ericson, Eric Axel, to General Electric Company. Switchboard drawout apparatus with interlocked joint clamping and racking mechanisms. 4,051,334, Cl. 200-50.0AA.
Ericson, Eric Axel; and Kaufhold, Frederick Daniel, to General Electric Company. Switchboard drawout having trip interlock and position indicating apparatus. 4,051,335, Cl. 200-50.0AA.
Ericson, Harry; and Fredriksson, Carl Otto. Solutions for cleaning surfaces of copper and its alloys. 4,051,057, Cl. 252-100.000.
Eriez Magnetics: *See—*
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Esco Manufacturing Company: *See—*
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Eskeli, Michael. Thermodynamic machine. 4,050,253, Cl. 60-650.000.
Esteban, Daniel J.; and Menez, Jean E., to International Business Machines Corporation. Process for block quantizing an electrical signal and device for implementing said process. 4,051,470, Cl. 340-347.0AD.
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Evans, Daniel J.; and Riester, Hubert, to Fischer & Porter Company. Shield and bracket assembly for flowmeter. 4,050,305, Cl. 73-209.000.
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Ewbank, Phillip K.; Ewbank, Charles R.; and Ewbank, Garen N., 4,050,858, Cl. 417-234.000.
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Heilhecker, Joe K.; Lock, Everett H.; and Deily, Fred H., 4,051,456, Cl. 340-18.0LD.
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Hamner, Glen P., 4,051,021, Cl. 208-216.000.
Kuntz, Irving, 4,051,312, Cl. 526-329.000.
Lundberg, Robert D.; and Makowski, Henry S., 4,051,217, Cl. 264-230.000.
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Newman, Neil F., 4,051,083, Cl. 260-5.000.
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Fairbairn, Geoffrey; Cooke, George Frederick; Winkworth, Reginald; and Koreki, Jan, to Techne(Cambridge) Limited. Method for temperature calibration of probes and the like. 4,050,289, Cl. 73-1.00F.
Fanslow, Glenn Ellsworth, to Iowa State University Research Foundation, Inc. Microwave field detector. 4,051,435, Cl. 324-95.000.
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Feingold, Robert M.; Hoover, Carl W., Jr.; and Rennie, John, to United States of America, Army. Channel plate multiplier having higher secondary emission coefficient near input. 4,051,403, Cl. 313-105.0CM.
Feiring, Andrew Edward, to Du Pont de Nemours, E. I., and Company. Fluorination process. 4,051,168, Cl. 260-456.00R.
Feldman, Bernard, to Transparent Conductors, Inc. Liquid crystal display device having particulate spacers in liquid crystal area and method of fabrication. 4,050,786, Cl. 350-160.0LC.
Ference, Edward W.; Houtman, John L.; and Waldby, Robert N., to United States of America, Energy Research and Development Administration. Nuclear reactor I. 4,050,986, Cl. 176-61.000.
Ferrell, Wesley: *See—*
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Fiberlok, Inc.: *See—*
Buck, George Sumner, Jr.; Weyker, Robert George; and Ward, Arthur Gerard, 4,050,977, Cl. 156-283.000.
Buck, George Sumner, Jr.; Weyker, Robert George; and Ward, Arthur Gerard, 4,051,294, Cl. 428-283.000.
Fiege, L. Gail. Retaining bar for circuit card file. 4,051,549, Cl. 361-399.000.
Fiessinger, Francois Marie, to Degremont. Process for purifying water. 4,051,028, Cl. 210-47.000.
Fincke, George C.; and Taylor, George W., to United States of America, Army. Time frequency diversity system. 4,051,449, Cl. 333-73.00C.
Firestone, Raymond A., to Merck & Co., Inc. Process for epimerizing beta-lactam antibiotic compounds by means of an acid quench. 4,051,132, Cl. 544-20.000.
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Lohr, Delmar Frederick, Jr.; and Kang, Jung Wong, 4,051,103, Cl. 260-45.75W.
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Fischer, Artur. Anchoring device for use in masonry and like structures with corrosion-protection feature. 4,050,346, Cl. 85-69.000.
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Fish, Franklin H., to United States of America, Navy. Split-path receiver for fiber optics application. 4,051,363, Cl. 250-199.000.
Fisher, Donald J., to Xerox Corporation. Non-filming dual additive developer. 4,051,077, Cl. 252-62.10P.
Fisher, John Sergio. Premanufactured modular housing building construction. 4,050,215, Cl. 52-79.300.
Fisons Limited: *See—*
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Flaig, Heinz, to DEMAG Aktiengesellschaft. Apparatus to reduce the effect of lateral forces during turns and/or one-sided loads on persons in a vehicle. 4,050,710, Cl. 280-112.00A.
Flanders, Robert D. Power tool track. 4,050,340, Cl. 83-743.000.
Flanders, Robert D. Disassembleable, reusable container. 4,050,604, Cl. 220-4.00F.
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Fleischman, Andor A., to Bell & Howell Company. Ultra-violet micrographic objective. 4,050,779, Cl. 350-2.000.
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Flisch, Felix. Cable and wire-rope cutter. 4,050,153, Cl. 30-250.000.
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Flynn Burner Corporation: *See—*
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Fodor, Lawrence M., to Phillips Petroleum Company. Blend of radial block copolymers having high impact strength. 4,051,197, Cl. 260-876.00B.
Fogle, Robert E.; and Floros, James, to Eriez Magnetics. Combination electromagnet and permanent magnet separator. 4,051,023, Cl. 209-223.00A.
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Foltz, Carl L.; Troutner, Vernon H.; and Trott, Arthur F., to Concept, Inc. Wire inserter. 4,050,528, Cl. 173-163.000.
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Forman, Tracy H.; Herskowitz, Nat H.; and Lawida, Arthur E. Folding stand. 4,050,658, Cl. 248-13.000.
Forster, Hans-Joachim M.; and Eltze, Ulrich, to Daimler-Benz Aktiengesellschaft. Automatic transmission with retarder. 4,050,556, Cl. 192-4.00B.
Fortuin, Michael Stanley: *See*—
Caunt, Anthony David; and Fortuin, Michael Stanley, 4,051,307, Cl. 526-77.000.
Fowler, Ralph A., to Westinghouse Electric Corporation. Double flexure disc electro-acoustic transducer. 4,051,455, Cl. 340-9.000.
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Frantz, Joseph F. Device for filling crank case or transmission of internal combustion engine with oil. 4,050,611, Cl. 222-88.000.
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Freeman, Eugene J., Jr., to Ever-Wear Products, Inc. Air distribution assembly. 4,050,365, Cl. 98-40.00C.
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Jester, Willi; and Tack, Hans, 4,050,129, Cl. 407-45.000.
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Kuhnert, Hans, 4,050,354, Cl. 90-13.00C.
Friedrich Maurer Soehne, Firma: *See*—
Bertschmann, Silvio; Koester, Waldemar; and Huber, Reinhold, 4,050,207, Cl. 52-396.000.
Friend, Jack M., to Puritan-Bennett Corporation. Respiration system with patient assist capability. 4,050,458, Cl. 128-145.800.
Frigo, Vito, to Ausatuft S.p.A. Molding press having a device for gripping and delivering elements to be molded. 4,050,870, Cl. 425-317.000.
Fritzenschaft, Max: *See*—
Bosch, Karl; and Fritzenschaft, Max, 4,050,285, Cl. 72-391.000.
Frodin, Gunnar Sten: *See*—
Wiklund, Curt Helmer; and Frodin, Gunnar Sten, 4,050,366, Cl. 98-110.000.
Froehlich, Alfred: *See*—
Piller, Bernhard; Lenoir, John; Froehlich, Alfred; Stauner, Thomas; and Tschopp, Paul, 4,051,123, Cl. 260-178.000.
Fruehauf Corporation: *See*—
Abbott, Richard, 4,051,286, Cl. 428-77.000.
Fuchs, Francis Joseph, Jr., to Western Electric Company, Inc. Apparatus and methods for forming an elongated product. 4,050,279, Cl. 72-261.000.
Fuerst, Harry W. Air vent cover assembly. 4,050,363, Cl. 98-37.000.
Fuji Film Co., Ltd.: *See*—
Kondo, Toshihiro, 4,051,398, Cl. 310-12.000.
Fuji Photo Film Co., Ltd.: *See*—
Fujita, Yoshihiro; Fuutagawa, Ikuo; and Muramatsu, Katsuji, 4,051,494, Cl. 354-145.000.
Hayashi, Takao; and Kato, Hajime, 4,051,303, Cl. 428-411.000.
Kondo, Toshihiro, 4,051,499, Cl. 354-234.000.
Takeda, Keiji; Murata, Masataka; and Ikeda, Teppei, 4,050,936, Cl. 96-28.000.
Fuji Photo Optical Co., Ltd.: *See*—
Suzuki, Masane, 4,051,483, Cl. 346-33.00A.
Fujii, Akira: *See*—
Shibayama, Kyoichi; Ono, Hiroshi; Jidai, Eiki; and Fujii, Akira, 4,051,091, Cl. 260-29.2TN.
Fujii, Takayoshi: *See*—
Ohtsuka, Shigeto; Ueno, Saburo; Yoshikumi, Chikao; Hirose, Fumio; Ohmura, Yoshio; Wada, Toshihiko; Fujii, Takayoshi; and Takahashi, Eiichi, 4,051,314, Cl. 536-1.000.
Fujikata, Kenji: *See*—
Inose, Fumiyuki; Fujikata, Kenji; and Yokozawa, Norio, 4,051,457, Cl. 340-146.3MA.
Fujima, Yukihisa: *See*—
Takahashi, Yasuro; Fujima, Yukihisa; Oguri, Masaharu; and Komori, Akito, 4,050,879, Cl. 431-174.000.
Fujimoto, Iwao: *See*—
Hayashi, Kazushige; Minemura, Norihiro; Fujimoto, Iwao; Ozaki, Kiyotaka; Yoshida, Norio; Morishita, Toshio; and Shinoki, Takanori, 4,051,287, Cl. 428-91.000.
Fujinawa, Masaaki; Takeyasu, Kiyoo; Iizuka, Kenichi; Uchida, Motokazu; and Uzuhashi, Hideo, to Hitachi, Ltd. Control system for a brushless motor. 4,051,417, Cl. 318-138.000.
Fujishige, Shoei, to Director-General of the Agency of Industrial Science and Technology. Method for forming images by irradiation of electron rays and resist compositions utilizable therefor. 4,051,271, Cl. 427-43.000.
Fujita, Hideo: *See*—
Kato, Hirosi; and Fujita, Hideo, 4,051,078, Cl. 260-2.00A.
Fujita, Masanori; and Suzuki, Sukenori, to Kabushiki Kaisha Seikosha. Electrooptic display device. 4,050,787, Cl. 350-160.0LC.
Fujita, Takayoshi: *See*—
Anahara, Meiji; and Fujita, Takayoshi, 4,050,225, Cl. 57-34.0HS.
Fujita, Yoshihiro; Fuutagawa, Ikuo; and Muramatsu, Katsuji, to Fuji Photo Film Co., Ltd. Photographic camera with built-in strobo flash light device. 4,051,494, Cl. 354-145.000.
Fujitsu Fanuc Limited: *See*—
Shichida, Hiromichi; Katsube, Hideo; Oyama, Shigeaki; Toyoda, Kenichi; and Saito, Mitsuo, 4,050,837, Cl. 408-35.000.
Fukunaka, Shiro: *See*—
Nakaoka, Kazuhide; Araki, Kenji; Iwase, Koji; Koike, Yasuo; and Fukunaka, Shiro, 4,050,959, Cl. 148-12.300.
Fukushima, Masami: *See*—
Yanagisawa, Hiroaki; Ando, Akiko; Fukushima, Masami; and Nakao, Hideo, 4,051,320, Cl. 542-420.000.
Fukuyama, Toshifumi; Asakura, Yasunori; and Onji, Norio, to Omron Tateisi Electronics Co. Photoelectric detector having an indicator for indicating the operating condition thereof. 4,051,365, Cl. 250-222.00R.
Fuller, Harold L., Jr.; and Stubbs, Joseph E., to Fuller, Harold L., Jr. Valve control for cylinder cutout system. 4,050,435, Cl. 123-198.00F.
Fulton, Theodore Alan, to Bell Telephone Laboratories, Incorporated. Current switched Josephson junction memory and logic circuits. 4,051,393, Cl. 307-306.000.
Funabiki, Kyohei: *See*—
Takemura, Takeshi; Katoh, Yoshihisa; Kurita, Shigeyuki; Sasaki, Susumu; Funabiki, Kyohei; and Hatano, Keizo, 4,051,098, Cl. 260-38.000.
Furukawa Electric Company Limited, The: *See*—
Ohkubo, Noriyoshi; and Kitamura, Nobu, 4,051,284, Cl. 428-36.000.
Furukawa, Tokinobu: *See*—
Nakazato, Norio; Hiratsuka, Kosai; and Furukawa, Tokinobu, 4,050,953, Cl. 127-60.000.
Furumaya, Kenichi: *See*—
Hashimoto, Masahiro; and Furumaya, Kenichi, 4,051,461, Cl. 364-900.000.
Furusaki, Shintaro: *See*—
Miyauchi, Terukatsu; and Furusaki, Shintaro, 4,051,011, Cl. 204-299.00R.
Fuutagawa, Ikuo: *See*—
Fujita, Yoshihiro; Fuutagawa, Ikuo; and Muramatsu, Katsuji, 4,051,494, Cl. 354-145.000.
G. D. Searle & Co.: *See*—
Krimmel, Carl Peter, 4,051,136, Cl. 260-268.00R.
Gad-Jets, Inc.: *See*—
Wyse, Harold G., 4,050,632, Cl. 239-425.000.
Gallagher, Angela Frances: *See*—
Steranko, James Joseph; Rogoff, Gerardo; Scott, Randall Dean; Gallagher, Angela Frances; and Burger, Peter, 4,051,459, Cl. 364-900.000.
Galvin, Aaron A., to American District Telegraph Company. Fluid flow detector for a fire alarm system. 4,051,467, Cl. 340-239.00S.
Gambro AG: *See*—
Riede, Gerhard, 4,051,041, Cl. 210-321.00B.
Gandy, Richard G.; and White, Vincent Cohee, to BJ-Hughes Inc. Method of making lightweight cement slurries and their uses. 4,050,948, Cl. 106-76.000.
Gantke, Franz; Walter, Harald; and Zywietz, Walter, to Hoesch Werke Aktiengesellschaft. Profile steel. 4,050,212, Cl. 52-726.000.
Gardiner, J. Brooke: *See*—
Elliott, Robert L.; and Gardiner, J. Brooke, 4,051,048, Cl. 252-51.50R.
Gardiner, John Brooke: *See*—
Elliott, Robert L.; and Gardiner, John Brooke, 4,051,050, Cl. 252-51.50R.
Garwood, George; and Flynn, Joseph C., to Wheaton Industries. Apparatus for fluid bed coating of glass bottles. 4,050,407, Cl. 118-58.000.
Gasier, James Mills; and Currie, William Edgar, to Parker-Hannifin Corporation. Swaging apparatus. 4,050,286, Cl. 72-416.000.
Gates, Peter Stuart; Gillon, John; and Saggers, David Thomas, to Fisons Limited. Certain 2-substituted-2,3-dihydro-5-benzofuranol esters of certain sulfonic acids. 4,051,154, Cl. 260-346.220.
Gates Rubber Company, The: *See*—
Ching, Larry K. W.; Coleman, Charles E.; and Uba, Toshio, 4,050,482, Cl. 141-1.100.
Neal, Ronald D.; Ross, Richard; and Hein, Joseph N., 4,050,651, Cl. 244-15.000.
Gault, Donald D.: *See*—
Gross, Roger A.; Radloff, Marvin D.; and Gault, Donald D., 4,050,799, Cl. 353-74.000.

Gaumer, Stuart J.: *See*—
Tobias, John W.; Taylor, Lynn J.; and Gaumer, Stuart J., 4,051,306, Cl. 526-1.000.
Geafer, Salahaddin: *See*—
Zbikowski, Gerhard; and Geafer, Salahaddin, 4,050,434, Cl. 123-140.0FG.
Gebr. Hofmann KG, Maschinenfabrik: *See*—
Hofmann, Dionys, 4,050,195, Cl. 51-169.000.
Geddes, Leslie A.; and Bourland, Joe D., to Purdue Research Foundation. Differential duration demultiplexing method and system. 4,051,539, Cl. 360-44.000.
Gee, Samuel, Sr., deceased: *See*—
McMullen, Willard C.; Gee, Samuel, Sr., deceased; Whitney, Patricia E., legal representative; and Bennett, Joan E., legal representative, 4,050,307, Cl. 73-337.000.
Geiger, Albert; and Bruckmann, Peter, to Geiger Plastic KG. Wire support system for training hop vines. 4,050,187, Cl. 47-45.000.
Geiger, Michael, to Friedrich Deckel Aktiengesellschaft. Spindlehead with tool-changing device. 4,050,146, Cl. 29-568.000.
Geiger Plastic KG: *See*—
Geiger, Albert; and Bruckmann, Peter, 4,050,187, Cl. 47-45.000.
Gelbein, Abraham P.; Janssen, Paul, deceased (by Janssen, Almuth, heir); and Richtzenhain, Hermann, to Lummus Company, The. Preparation of pyridines and nicotinonitrile from piperidines. 4,051,140, Cl. 260-290.00P.
Gelsenberg Mannesmann Umweltschutz GmbH: *See*—
Luchsinger, Peter; Muckenheim, Heribert; Riemann, Hanns-Helmut; Sonnenschein, Hans; and Michel, Erich, 4,050,387, Cl. 110-8.00A.
Gemein, Rudolf; and Wotschofsky, Franz, to Kraftwerk Union Aktiengesellschaft. Device for stabilizing the position of rotors of large steam turbines. 4,050,845, Cl. 415-172.00A.
Gendron, Aubrey Stewart; Abe, Shinichiro; Ettel, Victor Alexander; and O'Neill, Charles Edward, to International Nickel Company, Inc., The. Non-contaminating anode suitable for electrowinning applications. 4,051,000, Cl. 204-106.000.
General Battery Corporation: *See*—
Eberle, William J., 4,050,501, Cl. 164-68.000.
General Electric Company: *See*—
Adamson, Arthur P., 4,051,289, Cl. 428-113.000.
Armor, Anthony F.; and Winne, David H., 4,051,400, Cl. 310-58.000.
Brinner, Thomas Richard; and Stitt, Thomas Deltor, 4,051,421, Cl. 318-367.000.
DuBell, Thomas L., 4,050,241, Cl. 60-39.660.
Dusa, Donald J., 4,050,242, Cl. 60-204.000.
Ericson, Eric Axel, 4,051,334, Cl. 200-50.0AA.
Ericson, Eric Axel; and Kaufhold, Frederick Daniel, 4,051,335, Cl. 200-50.0AA.
Graham, Alfred Rapp, 4,050,348, Cl. 89-7.000.
Graham, Alfred Rapp, 4,050,349, Cl. 89-7.000.
Hales, Louis S.; Hamilton, Don R.; Weller, Harry F.; and Burgbacher, Donald E., 4,050,198, Cl. 51-281.00R.
Khalid, Syed J., 4,050,306, Cl. 73-212.000.
Knoble, David W., 4,051,410, Cl. 315-205.000.
Knoble, David W.; and Morais, Don, 4,051,411, Cl. 315-205.000.
Knoble, David W.; and Owen, Daniel V., 4,051,412, Cl. 315-205.000.
Misiura, Thaddeus Dominick; Vostovich, Joseph Edward; and Wahl, Ralph Edward, 4,051,298, Cl. 428-383.000.
Sheldon, Luther M., 4,050,774, Cl. 339-264.00R.
Stanwick, Casmer P.; and Jordan, Lawrence E., 4,051,399, Cl. 310-51.000.
Streicher, Heinz, 4,051,359, Cl. 362-4.000.
Tassie, Douglas Pray, 4,050,352, Cl. 89-7.000.
General Foods Corporation: *See*—
Kung, Jo-Fen Tung; and Epstein, Martin Franklin, 4,051,164, Cl. 260-448.80R.
Rose, Larry Edward; and Lawrence, Norman Francis, 4,051,162, Cl. 426-448.000.
General Mills Chemicals, Inc.: *See*—
MacKay, Kenneth D., 4,051,223, Cl. 423-157.000.
General Motors Corporation: *See*—
Bedford, Raymond E.; and Berg, Morris, 4,051,072, Cl. 252-464.000.
Brucken, Byron L.; and Watt, Roy E., 4,050,852, Cl. 417-273.000.
Cataldo, Roy S., 4,050,420, Cl. 123-30.00C.
Collins, George R.; and Large, William R., 4,050,249, Cl. 60-290.000.
Denzer, Richard E., 4,050,711, Cl. 280-278.000.
Denzer, Richard E.; Marsh, Gerald J.; and Shakespear, Horacio, 4,050,712, Cl. 280-278.000.
Hegedus, Louis; and Summers, Jack C., 4,051,073, Cl. 252-466.0PT.
Hile, John W., 4,051,504, Cl. 357-13.000.
Holleboom, Bruce W., 4,050,425, Cl. 123-119.0EC.
Kell, Nathaniel B., 4,050,330, Cl. 74-759.000.
Klingenmaier, Otto J., 4,050,996, Cl. 204-28.000.
Lemmer, Harold G., 4,050,932, Cl. 75-211.000.
Little, Harold A.; and Balsley, Richard L., 4,050,245, Cl. 60-313.000.
Sweet, Douglas W., 4,051,434, Cl. 324-78.00D.
Vaught, John M., 4,050,240, Cl. 60-39.650.
Watson, Richard D.; and Sowash, Thomas R., 4,050,771, Cl. 339-263.00R.
Williams, Jerry K., 4,050,713, Cl. 280-278.000.
General Tire & Rubber Company, The: *See*—
van Gils, Gerard E.; and Kalafus, Edward F., 4,051,281, Cl. 427-379.000.
Genis, Mariano Rodriguez. Sterilizing and sterility maintaining apparatus for dental and surgical tools and the like. 4,050,894, Cl. 21-86.000.
Georg Spiess GmbH: *See*—
Marass, Josef, 4,050,692, Cl. 271-267.000.
Gerritsen, Allen. Foldable fish net. 4,050,177, Cl. 43-12.000.
Gerster, John F.: *See*—
Schuppan, Dietrich; Gerster, John F.; and Leir, Charles M., 4,051,247, Cl. 424-258.000.
Gibson, David Vincent, to Dulux Australia Ltd. Liquid thermosetting coating compositions. 4,051,088, Cl. 260-20.000.
Giebeler, Bernhardt F., to BJ-Hughes Inc. Stroke actuated well testing tool. 4,050,512, Cl. 166-128.000.
Gieske, Henry Anthony; and Juneja, Prem Sagar, to Procter & Gamble Company, The. Oral compositions for plaque, caries, and calculus retardation with reduced staining tendencies. 4,051,234, Cl. 424-52.000.
Gilb, Tyrell, to Simpson Manufacturing Co., Inc. Ridge connector for light composite trusses. 4,050,210, Cl. 52-639.000.
Giles, Michael K.; and Iverson, Myren L., to United States of America, Navy. Photoparamp array multiplexer. 4,051,364, Cl. 250-199.000.
Gillon, John: *See*—
Gates, Peter Stuart; Gillon, John; and Saggers, David Thomas, 4,051,154, Cl. 260-346.220.
Gilmore, Guy T., to Multi-Fab, Inc. Portable grooving tool. 4,050,335, Cl. 82-4.00C.
Gilmour, Richard C. Beach cleaning apparatus. 4,050,518, Cl. 171-116.000.
Girling Limited: *See*—
Harries, David Anthony; and Mortimer, Ivan, 4,050,749, Cl. 303-119.000.
Margetts, Hugh Grenville, 4,050,548, Cl. 188-71.800.
Giuffre, Anthony A. Environmental hood and duct structure for griddles. 4,050,446, Cl. 126-299.00E.
Glaesel, Gottfried, to Hego Electric GmbH. Insulating casing for electrical spade terminal sockets. 4,050,757, Cl. 339-59.00R.
Glanz, Ronald Paul, to Chemetron Corporation. Double-sigmoid connector. 4,050,829, Cl. 403-205.000.
Glumac, Nick P., to Toter-Tee, Inc. Liftable bed truck body configuration for removable storage unit. 4,050,707, Cl. 280-43.230.
Gnyra, Bohdan, to Alcan Research and Development Limited. Coarsening of partially calcined alumina dust. 4,051,222, Cl. 423-127.000.
Godfrey, John Carl; and Rubinfeld, Joseph, to Bristol-Myers Company. 6''-Deoxykanamycin B and 6''-deoxytobramycin. 4,051,315, Cl. 536-10.000.
Goffe, Charles A., deceased (by Goffe, Patricia A., executrix); Rand, Royden N.; and Wu, Tai W., to Eastman Kodak Company. Integral analytical element. 4,050,898, Cl. 23-253.0TP.
Goffe, Patricia A., executrix: *See*—
Goffe, Charles A., deceased; Rand, Royden N.; and Wu, Tai W., 4,050,898, Cl. 23-253.0TP.
Goldammer, Georg: *See*—
Landwehrkamp, Hans; Hoeber, W. Gerhard; Goldammer, Georg; and Oexler, Rudolf, 4,050,228, Cl. 57-58.950.
Golden Vale Food Products Limited: *See*—
Mulvihill, Thomas Kevin; and Murphy, Denis, 4,050,369, Cl. 99-463.000.
Goldenberg, Emmanuel: *See*—
Dawans, Francois; and Goldenberg, Emmanuel, 4,051,172, Cl. 526-90.000.
Goldenberg, Harold Jacob: *See*—
Harris, Don Navarro; Phillips, Marie B.; and Goldenberg, Harold Jacob, 4,051,236, Cl. 424-101.000.
Goldhagen, Samuel; Heller, Harry; and Rothenstein, Julius, to United States of America, Navy. Explosive composition containing a hydroxyalkyl acrylate copolymer binder. 4,050,968, Cl. 149-19.400.
Goldmann, Wolf; Schepers, Georg; Heinemann, Otto; Schmits, Heinz-Herbert; and Ritzmann, Horst, to Polysius AG. Apparatus and methods for the heat treatment of fine-grained materials. 4,050,883, Cl. 432-14.000.
Gollnick, Cyril R., to Leach Company. Refuse loading apparatus. 4,050,594, Cl. 214-83.300.
Golobay, Gary L., to J. I. Case Company. Incremental digital control circuit. 4,051,416, Cl. 318-85.000.
Goltsos, Costas E., to Teckton, Inc. Package for heating food in electrical appliances. 4,051,266, Cl. 426-120.000.
Goodwin, William D., to Introtech. Vegetable protein isolate and method of producing same. 4,051,114, Cl. 260-123.500.
Goodyear Tire & Rubber Company, The: *See*—
Olsen, Richard J., 4,050,495, Cl. 152-187.000.
Gordon, Jason Morse, to United Technologies Corporation. Optical apparatus for sensing clustered package orientation. 4,051,366, Cl. 250-223.00B.
Gorski, Dennis M.; Neuber, Dieter; and Wildmoser, Martin Michael, to Arenco Machine Company, Inc. Package for orienting a plurality of articles. 4,050,579, Cl. 206-460.000.
Gorter, Werner: *See*—
Kresta, Erich; and Gorter, Werner, 4,051,292, Cl. 428-212.000.
Goto, Tatsuo: *See*—
Shimomura, Raiji; Habu, Toru; Itoh, Hisaki; Sakai, Naomi; and Goto, Tatsuo, 4,050,293, Cl. 73-105.000.

Goto, Tokuju: *See*—
Tsuruta, Motohiro; Kimura, Hiroshiro; Koshimo, Akio; Nara, Hirohisa; Goto, Tokuju; and Amemiya, Kunio, 4,051,215, Cl. 264-137.000.

Gottfried Bischoff Bau kompl. Gasreinigungs-und Wasserruckkuhlanlagen Kommanditgesellschaft: *See*—
Kleeberg, Ulrich; Leimkuhler, Jurgen; Knospe, Jurgen; and Stohr, Manfred, 4,050,871, Cl. 425-317.000.

Gouinlock, Edward V., Jr.; and Rosenfeld, Jerold C., to Hooker Chemicals & Plastics Corporation. High molecular weight copolyester resins having a high degree of alternating structure. 4,051,106, Cl. 260-47.00C.

Graco Inc.: *See*—
Vork, William Duncan, 4,050,859, Cl. 417-386.000.

Graham, Alfred Rapp, to General Electric Company. Liquid propellant gun (controlled leakage regenerative piston). 4,050,348, Cl. 89-7.000.

Graham, Alfred Rapp, to General Electric Company. Liquid propellant gun (scaling with multiple combustion assemblies). 4,050,349, Cl. 89-7.000.

Graham, Harold Nathaniel: *See*—
Sanderson, Gary Warner; Hoefler, Andrew Charles; Graham, Harold Nathaniel; and Coggon, Philip, 4,051,264, Cl. 426-52.000.

Grandi Motori Trieste S.p.A. G.M.T. - Fiat, Ansaldo, C.R.D.A.: *See*—
Cendak, Bruno, 4,050,421, Cl. 123-41.720.

Granges NYBY AB: *See*—
Aslund, Christer, 4,050,143, Cl. 29-420.500.

Grant, Graham Cameron. Apparatus for saturated gas delivery. 4,051,205, Cl. 261-70.000.

Grapha-Holding AG: *See*—
Muller, Hans, 4,050,573, Cl. 198-366.000.

Grat, Felix R., to Rame-Hart, Inc. Drop measuring apparatus, and a method of evaluating materials wettability. 4,050,822, Cl. 356-171.000.

Great Lakes Industries, Inc.: *See*—
Secor, Arthur D., 4,050,643, Cl. 242-72.00R.

Greaves, Melvin J.; and Razgaitis, Frank V., to Arthur G. McKee & Company. Charging apparatus for shaft furnaces. 4,050,592, Cl. 214-18.200.

Greenaway, Philip Ernest; and Rollett, John Mortimer, to Post Office, The. Active networks and signalling equipment. 4,051,385, Cl. 307-233.00R.

Greer Hydraulics, Inc.: *See*—
Harris, Newton T., III, 4,051,338, Cl. 200-85.00R.

Gretsch-Unitas GmbH Baubeschlagfabrik: *See*—
Maus, Julius, 4,050,364, Cl. 98-37.000.

Griffith, Louis E.: *See*—
Ebner, Peter R.; and Griffith, Louis E., 4,051,486, Cl. 354-7.000.

Griffiths, David Thomas, to Youngflex, S.A. Seat frames. 4,050,738, Cl. 297-452.000.

Griffiths, Frank Anthony. Signal processor for reducing interference between frequency-modulated signals. 4,051,533, Cl. 358-167.000.

Grigat, Ernst; and Hetzel, Hartmut, to Bayer Aktiengesellschaft. Process for the continuous degradation of plastics. 4,051,212, Cl. 264-102.000.

Grijalba, Abel D.: *See*—
Warner, Ronald E.; Healey, Francis J.; and Grijalba, Abel D., 4,050,134, Cl. 29-156.80R.

Groetsch, Ewald: *See*—
Coleman, Ronald J., 4,050,671, Cl. 254-7.00R.

Groetsch, Gilbert: *See*—
Coleman, Ronald J., 4,050,671, Cl. 254-7.00R.

Gross, Roger A.; Radloff, Marvin D.; and Gault, Donald D., to Bell & Howell Company. Microform reader. 4,050,799, Cl. 353-74.000.

Grossner, Horst; Liebold, Hans; and Wehnert, Jurgen, to Daimler-Benz Aktiengesellschaft. Process and apparatus for controlling the brake force on the wheels of trailers. 4,050,550, Cl. 188-112.000.

Grotnes Machine Works, Inc.: *See*—
Luedi, Hans R., 4,050,135, Cl. 29-159.100.

Grove Valve and Regulator Company: *See*—
Brumm, Richard S., 4,050,669, Cl. 251-5.000.

Grube, Kenneth E.; Harrington, Vincent E.; and Harrington, James V. Method and apparatus for fragmenting certain solid wastes. 4,050,899, Cl. 23-259.100.

Gruber, John R. Shell rotor direct current generator. 4,051,402, Cl. 310-266.000.

Gruner, Heinz Walter, to Sybron Corporation. Amplifier structure for low-level voltage measurements. 4,051,444, Cl. 330-68.000.

GTE Sylvania Incorporated: *See*—
Smithgall, Harry E., 4,050,763, Cl. 339-111.000.
Vibert, Edward J., 4,051,544, Cl. 361-45.000.

Guczoghy, Lajos; Pfliegel, Todor; Puklics, Maria; Institoris, Laszlo; and Seres, Jeno, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. N-(triaryl-methyl)-amidines, process for the preparation thereof and compositions containing the same. 4,051,156, Cl. 260-393.000.

Gudat, Wolfgang: *See*—
Ruhnau, Gerhard; Gudat, Wolfgang; Liermann, Peter; and Hesse, Karl-Heinz, 4,050,747, Cl. 303-95.000.

Guenther, Ernst: *See*—
Kissel, Ernst; Neumann, Eckart; Guenther, Ernst; Valentin, Guenter; and Hoerauf, Werner, 4,051,113, Cl. 260-78.00L.

Guggemos, Kenneth F. Wall mounted hinged base. 4,051,362, Cl. 362-432.000.

Guild, George Arthur: *See*—
Wilson, Alister; Marr, William David; and Guild, George Arthur, 4,051,288, Cl. 428-102.000.

Guinter, S. Robert: *See*—
Provi, Mike A.; and Guinter, S. Robert, 4,050,532, Cl. 177-211.000.

Gulf South Research Institute: *See*—
Klein, Elias; Smith, James K.; and Morton, Frederick C., 4,051,300, Cl. 428-398.000.

Gullick Dobson Limited: *See*—
Phillips, Reginald Andrew; and Darbyshire, Kenneth, 4,050,256, Cl. 61-45.00D.

Gumb, Beverley William, to Northern Telecom Limited. Interconnector for adapting existing telephone outlets to plug-in outlets. 4,050,768, Cl. 339-154.00A.

Gunjima, Tomoki; and Ichiki, Toshio, to Asahi Glass Company, Ltd. Electrodialysis for aqueous solution of base. 4,051,002, Cl. 204-180.00P.

Gurgens, Rainer Eberhard: *See*—
Heider, Michael; and Gurgens, Rainer Eberhard, 4,050,565, Cl. 197-6.300.

Gurr, Robert H.; and Broggie, Roger E., to Walt Disney Productions. High capacity passenger transport apparatus. 4,050,385, Cl. 104-173.0ST.

Gutman, Arnold D., to Stauffer Chemical Company. Method of use and process for preparing phosphoroiminobenzoylurea insecticides. 4,051,239, Cl. 424-211.000.

Guy, George Trevor Palfreyman and Roger Jerome, executors: *See*—
Robbins, Joseph Henry, deceased; and Acton, John Edward, 4,050,674, Cl. 254-93.00H.

Gwozdz, Joseph W., to McKinney Manufacturing Company. Door hinge. 4,050,115, Cl. 16-128.00R.

Gyori, Robert Paul; and Tullio, Thomas, to De luxe General, Incorporated. Additive color printing method and apparatus. 4,050,808, Cl. 355-38.000.

H. & D. E. Watts Limited: *See*—
Watts, Horace, 4,050,475, Cl. 137-625.170.

Haaf, Franz: *See*—
Simak, Petr; Herrle, Karl; Haaf, Franz; and Hatzmann, Guenter, 4,051,200, Cl. 260-899.000.

Haag, Walter, to Albert Haag KG. Creeling device for bobbins. 4,050,649, Cl. 242-130.100.

Haavik, Harold K., to Nash Engineering Company, The. Liquid ring pumps and compressors using a ferrofluidic ring liquid. 4,050,851, Cl. 417-68.000.

Habegger, Harold. Thread-rolling head. 4,050,276, Cl. 72-104.000.

Hablitzel, Hermann, to Volkswagenwerk Aktiengesellschaft. Energy absorbing bumper. 4,050,726, Cl. 293-71.00R.

Habu, Teiji; Ishihara, Masao; Sakamoto, Eiichi; Yamada, Hiroshi; and Kaneshige, Masaaki, to Konishiroku Photo Industry Co., Ltd. Process for the preparation of a photographic material. 4,050,940, Cl. 96-114.500.

Habu, Toru: *See*—
Shimomura, Raiji; Habu, Toru; Itoh, Hisaaki; Sakai, Naomi; and Goto, Tatsuo, 4,050,293, Cl. 73-105.000.

Hachmann, Friedrich, to O & K Orenstein & Koppel Aktiengesellschaft. Control device for hydrostatic drive, especially for fork lift truck. 4,050,248, Cl. 60-445.000.

Haeny & Cie AG: *See*—
Jaggi, Hans; and Heimgartner, Hans, 4,050,356, Cl. 91-306.000.

Haffer, Gregor: *See*—
Sauer, Gerhard; Hauser, Helmut; Haffer, Gregor; Ruppert, Juergen; Eder, Ulrich; and Wiechert, Rudolf, 4,051,188, Cl. 260-590.0FA.

Hafner, Leo, to Treibacher Chemische Werke Aktiengesellschaft. Method of preparing fluorine-free rare earth metal compounds from such compounds containing fluorine. 4,051,219, Cl. 423-21.000.

Hage, Charles Thomas, to Eastman Kodak Company. Electrophotographic copying apparatus for two-sided copying. 4,050,805, Cl. 355-14.000.

Hahner, Reinhard: *See*—
Reibetanz, Wilbert; Wanner, Karl; and Hahner, Reinhard, 4,050,345, Cl. 85-68.000.

Hakata, Masayuki, to Casio Computer Co., Ltd. Keyboard controlled data converter. 4,051,356, Cl. 235-310.000.

Hake, Kenneth A., to Kent Manufacturing Co., Inc. Cultivator tooth clamp. 4,050,524, Cl. 172-707.000.

Halasa, Adel Farhan, to Firestone Tire & Rubber Company, The. Process for polymerizing butadiene with cobalt complex, AlR_3 and CS_2. 4,051,308, Cl. 526-141.000.

Hales, Louis S.; Hamilton, Don R.; Weller, Harry F.; and Burgbacher, Donald E., to General Electric Company. Method for shaping the edge of a blade element. 4,050,198, Cl. 51-281.00R.

Hall, John Emmett, to Downs Surgical Limited. Surgical cable tensioning instrument. 4,050,464, Cl. 128-303.00R.

Halpern, Otto: *See*—
Prince, Anthony; Halpern, Otto; and Ackrell, Jack, 4,051,148, Cl. 260-327.00B.

Hamada, Morio, to Murata, Tokao. Electric locking device. 4,051,548, Cl. 361-171.000.

Hamilton Communications, Inc.: *See*—
Webb, William E.; and Ehas, Stephan J., 4,050,566, Cl. 197-19.000.

Hamilton, Don R.: *See*—
Hales, Louis S.; Hamilton, Don R.; Weller, Harry F.; and Burgbacher, Donald E., 4,050,198, Cl. 51-281.00R.

Hamlin, Thomas J.: *See*—
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,050,688, Cl. 271-5.000.

Hammond, Peter R.; Schimitschek, Erhard J.; and Trias, John A., to

United States of America, Navy. 7-Amino coumarin dyes for flash-lamp-pumped dye lasers. 4,051,062, Cl. 252-301.170.

Hamner, Glen P., to Exxon Research & Engineering Co. Hydrodesulfurization of hydrocarbon feed utilizing a silica stabilized alumina composite catalyst. 4,051,021, Cl. 208-216.000.

Hamrick, Joseph T.; and Rose, Leslie C., to World Energy Systems. Insitu hydrogenation of hydrocarbons in underground formations. 4,050,515, Cl. 166-303.000.

Hancock Laboratories, Inc.: *See*—
Hancock, Warren D.; and Sattler, Frederick P., 4,050,893, Cl. 8-94.110.

Hancock, Warren D.; and Sattler, Frederick P., to Hancock Laboratories, Inc. Arrangement for preparing natural tissue for implantation. 4,050,893, Cl. 8-94.110.

Hanny, John Franklin, to NCR Corporation. Light-reflecting analytical device. 4,050,820, Cl. 356-103.000.

Hansberg, Julius. Core-blowing machine for preparing moulds and foundry cores. 4,050,504, Cl. 164-201.000.

Hara, Shinichi; and Kato, Taro, to NGK Insulators, Ltd. Method of treating sewage sludge. 4,050,390, Cl. 110-15.000.

Harada, Fumio: *See*—
Inoue, Hajime; Harada, Fumio; Kato, Kazunobu; and Oikawa, Syoji, 4,051,001, Cl. 204-151.000.

Harada, Isamu: *See*—
Wakana, Hiroshi; Harada, Isamu; and Honma, Tsutomu, 4,050,605, Cl. 220-5.00A.

Harbor Products, Inc.: *See*—
Humberstone, John; Deal, William L.; and Edgington, Arthur E., 4,050,358, Cl. 92-103.00F.

Hardy, Edgar E.; and David, Donald J., to Monsanto Research Corporation. Optical analytical device, waveguide and method. 4,050,895, Cl. 23-230.00R.

Hardy, Michel; and Humbert, Daniel, to Roussel-UCLAF. Salts of 2-alkylthiazole-5-methanol derivatives. 4,051,249, Cl. 424-270.000.

Hargrove, Wilma Rae. Storage bag for use with a students chair-desk. 4,050,491, Cl. 150-1.600.

Harnisch, Horst: *See*—
Friedrich, Adolf; Harnisch, Horst; and Raue, Roderich, 4,051,134, Cl. 544-217.000.

Harpman, Webster B.; and Mahoney, Fred G., to Econo Fuel Systems, Inc. Hot fuel gas generator. 4,050,419, Cl. 123-3.000.

Harralson, John C.: *See*—
Schaab, Rudolph S.; and Harralson, John C., 4,050,267, Cl. 66-9.00B.

Harries, David Anthony; and Mortimer, Ivan, to Girling Limited. Control valve assemblies for vehicle anti-skid braking systems. 4,050,749, Cl. 303-119.000.

Harrington, Colin John: *See*—
Elliott, John Scotchford; Jayne, Gerald John Joseph; Askew, Herbert Frank; and Harrington, Colin John, 4,051,053, Cl. 252-78.300.

Harrington, James V.: *See*—
Grube, Kenneth E.; Harrington, Vincent E.; and Harrington, James V., 4,050,899, Cl. 23-259.100.

Harrington, Vincent E.: *See*—
Grube, Kenneth E.; Harrington, Vincent E.; and Harrington, James V., 4,050,899, Cl. 23-259.100.

Harris, Don Navarro; Phillips, Marie B.; and Goldenberg, Harold Jacob, to E. R. Squibb & Sons, Inc. Inhibition of blood platelet aggregation. 4,051,236, Cl. 424-101.000.

Harris, Edward J.: *See*—
Burchette, Robert L., Jr.; and Harris, Edward J., 4,050,645, Cl. 242-125.100.

Harris, Newton T., III, to Greer Hydraulics, Inc. Load responsive switch actuator. 4,051,338, Cl. 200-85.00R.

Harris, Nicholas D., to Morton-Norwich Products, Inc. Vinylbenzyl esters of N-BOC-amino acids. 4,051,171, Cl. 560-157.000.

Harris, Robert M.; Mills, Gene F.; and Shaffer, David T., to Union Insulating Company. Clamp for securing bar hanger to electrical wiring box. 4,050,603, Cl. 220-3.900.

Harrison, Ian T.: *See*—
Fried, John H.; and Harrison, Ian T., 4,051,233, Cl. 424-317.000.

Harrod, Michael K.: *See*—
Mueller, Edward E.; Painter, Thomas H.; and Harrod, Michael K., 4,050,635, Cl. 241-24.000.

Harshaw Chemical Company, The: *See*—
Swinehart, Carl F., 4,050,905, Cl. 23-301.000.

Harter, Joseph William; and Beitzel, Stuart Wallace, to O-3 Company. Apparatus for fluid treatment by electron emission. 4,051,043, Cl. 250-531.000.

Hartman, William Law, to Procter & Gamble Company, The. Abrasive scouring compositions. 4,051,056, Cl. 252-99.000.

Hartmann, Max: *See*—
Eggmann, Jean; and Hartmann, Max, 4,050,660, Cl. 248-19.000.

Harvey, Donald Malcolm, to Eastman Kodak Company. Programmed exposure control apparatus. 4,051,497, Cl. 354-231.000.

Harvey, Norman L. Digital measuring system for engine fuel performance. 4,050,295, Cl. 73-114.000.

Harwood, Leopold Albert, to RCA Corporation. Phase control circuit suitable for use in a tint control stage of a color television system. 4,051,519, Cl. 358-21.000.

Harwood, Leopold Albert, to RCA Corporation. Video amplifier for combining luminance and chrominance signals. 4,051,521, Cl. 358-30.000.

Hasegawa, Yoshikazu: *See*—
Kuwana, Noriaki; Hasegawa, Yoshikazu; and Nozu, Yukio, 4,050,989, Cl. 195-29.000.

Hashimoto, Masahiro; and Furumaya, Kenichi, to Hitachi, Ltd. Management table apparatus in memory hierarchy system. 4,051,461, Cl. 364-900.000.

Hashizume, Hiroshi: *See*—
Kimura, Tsuneo; Hashizume, Hiroshi; and Izumisawa, Yoshiaki, 4,051,178, Cl. 260-524.00R.

Hasircoglu, Alexander William, to Du Pont de Nemours, E. I., and Company. Electrical connector. 4,050,755, Cl. 339-17.0CF.

Hastik, Walter: *See*—
Cappel, Fred; Hastik, Walter; Fleming, Georg; and Hofmann, Pierre, 4,050,924, Cl. 75-5.000.

Hastings, Jerome K., to Cutler-Hammer, Inc. Snap-in bushing switch removal tool. 4,050,148, Cl. 29-764.000.

Hata, Kazuo; and Mitani, Sumio, to Dainippon Screen Seizo Kabushiki-Kaisha. Method for coating the photoresist onto a belt-like material comprising a perforated carrier and metallic foil. 4,051,274, Cl. 427-172.000.

Hatano, Isao; Nagano, Akira; and Urasaki, Kazuaki, to Omron Tateisi Electronics Co. Key input means providing common key identifying and display driving digit timing signals. 4,051,471, Cl. 340-365.00S.

Hatano, Keizo: *See*—
Takemura, Takeshi; Katoh, Yoshihisa; Kurita, Shigeyuki; Sasaki, Susumu; Funabiki, Kyohei; and Hatano, Keizo, 4,051,098, Cl. 260-38.000.

Hatch, Kenneth F., to Picker Corporation. Delay line clipping in a scintillation camera system. 4,051,373, Cl. 250-363.00S.

Hatchett, George L.: *See*—
Laikin, Milton; and Hatchett, George L., 4,051,523, Cl. 358-99.000.

Hattori, Kinya: *See*—
Watanabe, Akinori; Tanoshima, Katsuhide; Noguchi, Matsusaburo; and Hattori, Kinya, 4,050,377, Cl. 101-114.000.

Hatzmann, Guenter: *See*—
Simak, Petr; Herrle, Karl; Haaf, Franz; and Hatzmann, Guenter, 4,051,200, Cl. 260-899.000.

Hauk, Peter: *See*—
Matthews, John W.; Sigel, Harry Dennis; and Hauk, Peter, 4,050,665, Cl. 248-358.00R.

Haupin, Warren E., to Aluminum Company of America. Thermoelectric heat flow transducer. 4,050,302, Cl. 73-190.00H.

Hauser, Helmut: *See*—
Sauer, Gerhard; Hauser, Helmut; Haffer, Gregor; Ruppert, Juergen; Eder, Ulrich; and Wiechert, Rudolf, 4,051,188, Cl. 260-590.0FA.

Hauser, Raimund: *See*—
Wendisch, Irmgard, 4,050,788, Cl. 350-184.000.

Haveg Industries, Inc.: *See*—
Anderson, Robert W., deceased; and Smith, Robert E., Jr., 4,051,324, Cl. 174-121.00R.

Hawkins, Wallace H. Dolly for lifting and transporting vehicle wheels. 4,050,597, Cl. 214-331.000.

Hawksworth, Frederick James, to Rolls-Royce Motors Limited. Transmission mechanisms. 4,050,320, Cl. 74-112.000.

Hayahusa, Nobuyuki; and Uno, Hiroaki, to Toshiba Kikai Kabushiki Kaisha. Friction type yarn false twisting apparatus. 4,050,229, Cl. 57-77.400.

Hayakawa, Koji: *See*—
Okamoto, Tomiyasu; Nishimoto, Tsunanori; Sawada, Kaoru; Hayakawa, Koji; and Kurihara, Tomomichi, 4,050,609, Cl. 220-9.0LG.

Hayashi, Kazushige; Minemura, Norihiro; Fujimoto, Iwao; Ozaki, Kiyotaka; Yoshida, Norio; Morishita, Toshio; and Shinoki, Takanori, to Teijin Limited. Raised woven or knitted fabric and process for producing the same. 4,051,287, Cl. 428-91.000.

Hayashi, Takao; and Kato, Hajime, to Fuji Photo Film Co., Ltd. Recording sheet. 4,051,303, Cl. 428-411.000.

Hayashi, Yoshihiro: *See*—
Yamada, Makoto; Sasaki, Shiro; Kanazawa, Shigenori; and Hayashi, Yoshihiro, 4,050,717, Cl. 280-744.000.

Hayes, John C., to UOP Inc. Dehydrogenation method and sulfided nonacidic multimetallic catalytic composite for use therein. 4,051,071, Cl. 252-439.000.

Hayner, Paul F.; Eldridge, David G.; Bernier, Edgar R.; and Henderson, Richard B., to Sanders Associates, Inc. Low noise hydraulic servo valve. 4,050,476, Cl. 137-625.620.

Hayward, William George. Magnetic loops closure elements for electric motor. 4,051,401, Cl. 310-216.000.

Hazdra, James J.; Rausch, David J.; and Munninger, Karl O., to Hutchinson, John L., a part interest. Antithrombogenic hemo dialysis membranes. 4,051,040, Cl. 210-321.00B.

Healey, Francis J.: *See*—
Warner, Ronald E.; Healey, Francis J.; and Grijalba, Abel D., 4,050,134, Cl. 29-156.80R.

Healy, James W.; and Currier, Bob L., to Jonathan Systems. Patient monitoring system. 4,051,522, Cl. 358-86.000.

Heaney, Donald F., to Dravo Corporation. Activated sewage plant and process. 4,051,039, Cl. 210-274.000.

Hecht, Ulrich: *See*—
Adalbert, Gerhard; Hess, Jurgen; and Hecht, Ulrich, 4,050,263, Cl. 62-243.000.

Hecker, Wolfgang: *See*—
Schmedemann, Walter; and Hecker, Wolfgang, 4,050,551, Cl. 188-181.00C.

Heckman, LeRoy Francis, Jr., to RCA Corporation. Radio frequency coupler. 4,051,447, Cl. 333-24.00R.
Heckman, Ronald A. Hang glider. 4,050,654, Cl. 244-49.000.
Hegedus, Louis; and Summers, Jack C., to General Motors Corporation. Pellet-type oxidation catalyst. 4,051,073, Cl. 252-466.0PT.
Hego Electric GmbH: *See*—
Glaesel, Gottfried, 4,050,757, Cl. 339-59.00R.
Heidelberger Druckmaschinen Aktiengesellschaft: *See*—
Pfizenmaier, Wolfgang, 4,050,380, Cl. 101-365.000.
Heider, Michael; and Gurgens, Rainer Eberhard, to Adrema Pitney Bowes. Keyboard controlled electronic embossing machine. 4,050,565, Cl. 197-6.300.
Heidt, Henry M., to Babcock & Wilcox Company, The. Method for reducing uranium tetrafluoride. 4,051,227, Cl. 423-259.000.
Heilbecker, Joe K.; Lock, Everett H.; and Deily, Fred H., to Exxon Production Research Company. Apparatus for establishing and maintaining electric continuity in drill pipe. 4,051,456, Cl. 340-18.0LD.
Heim, Thomas M., executor: *See*—
Turner, James Wesley, deceased; and Spinks, Ray E., 4,050,122, Cl. 24-230.00A.
Heimgartner, Hans: *See*—
Jaggi, Hans; and Heimgartner, Hans, 4,050,356, Cl. 91-306.000.
Hein, Helmut; Hermann geb Gleissner, Rosmarie; and Schaefer, Hartmann, to Byk Gulden Lomberg Chemische Fabrik GmbH. Microbicidal nitrofuryl compounds. 4,051,253, Cl. 424-285.000.
Hein, Joseph N.: *See*—
Neal, Ronald D.; Ross, Richard; and Hein, Joseph N., 4,050,651, Cl. 244-15.000.
Heinemann, Otto: *See*—
Goldmann, Wolf; Schepers, Georg; Heinemann, Otto; Schmits, Heinz-Herbert; and Ritzmann, Horst, 4,050,883, Cl. 432-14.000.
Heinemann, Robert W., to United States of America, Army. Low density indirect fire munition system (U). 4,050,381, Cl. 102-4.000.
Heissler, Herbert; Hitsch, Eckart; and Scheer, Wolfgang, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Method of manufacturing a fiber reinforced composite material. 4,050,997, Cl. 204-28.000.
Heller, Harry: *See*—
Goldhagen, Samuel; Heller, Harry; and Rothenstein, Julius, 4,050,968, Cl. 149-19.400.
Hellmann, James J. Manual trash compactor. 4,050,373, Cl. 100-240.000.
Helminiak, Thaddeus E.; and Arnold, Fred E., to United States of America, Air Force. Preparation of films and coatings of para ordered aromatic heterocyclic polymers. 4,051,108, Cl. 260-47.0CP.
Hemp, John; and Wyatt, Derek Gerald, to National Research Development Corporation. Fluid flow meters. 4,050,303, Cl. 73-194.0EM.
Hemsath, Klaus H.; and Thekdi, Arvind C., to Midland-Ross Corporation. Apparatus for cooling hot gases. 4,050,912, Cl. 55-223.000.
Henderson, Richard B.: *See*—
Hayner, Paul F.; Eldridge, David G.; Bernier, Edgar R.; and Henderson, Richard B., 4,050,476, Cl. 137-625.620.
Henkel & Cie GmbH: *See*—
Bowing, Walter Grosse; Mrozek, Hinrich; Schlussler, Hans-Joachim; Tinnefeld, Bernd; and Vogele, Peter, 4,051,058, Cl. 252-186.000.
Bowing, Walter Grosse; Mrozek, Hinrich; Schlussler, Hans-Joachim; Tinnefeld, Bernd; and Vogele, Peter, 4,051,059, Cl. 252-186.000.
Henrich KG, Firma: *See*—
Henrich, Werner, 4,050,640, Cl. 242-25.00R.
Henrich, Werner, 4,050,641, Cl. 242-47.000.
Henrich, Werner, to Henrich KG, Firma. Apparatus for winding wire and the like. 4,050,640, Cl. 242-25.00R.
Henrich, Werner, to Henrich KG, Firma. Apparatus for winding wire. 4,050,641, Cl. 242-47.000.
Henricksen, Clifford A., to Altec Corporation. Acoustical transformer for horn-type loudspeaker. 4,050,541, Cl. 181-159.000.
Herbert, Edward. Tracking lens system for solar collectors and skylights. 4,050,789, Cl. 350-226.000.
Hercules Incorporated: *See*—
Reid, Albert Richard, 4,051,086, Cl. 260-17.4GC.
Towle, Gordon Anson, 4,051,317, Cl. 536-114.000.
Hereford, Judson A.; and Beard, Franklin. Fluid lifting apparatus. 4,050,854, Cl. 417-121.000.
Hergt, Peter: *See*—
Metzinger, Wolfgang; Boll, Bernd; and Hergt, Peter, 4,050,846, Cl. 415-182.000.
Herkt, Karl-Heinz: *See*—
Pfeiffer, Kurt; Dietrich, Johannes; Beckmann, Gunter; and Herkt, Karl-Heinz, 4,050,901, Cl. 23-285.000.
Herlihy, Patricia: *See*—
Razdan, Raj Kumar; Dalzell, Haldean Cloyce; and Herlihy, Patricia, 4,051,152, Cl. 260-345.300.
Hermann geb Gleissner, Rosmarie: *See*—
Hein, Helmut; Hermann geb Gleissner, Rosmarie; and Schaefer, Hartmann, 4,051,253, Cl. 424-285.000.
Hermans, Marie E. A.: *See*—
Kanij, Johannes B. W.; Noothout, Arend J.; and Hermans, Marie E. A., 4,051,060, Cl. 252-301.1R.
Herrle, Karl: *See*—
Simak, Petr; Herrle, Karl; Haaf, Franz; and Hatzmann, Guenter, 4,051,200, Cl. 260-899.000.
Herskowitz, Nat H.: *See*—
Forman, Tracy H.; Herskowitz, Nat H.; and Lawida, Arthur E., 4,050,658, Cl. 248-13.000.
Herzog, Gunter, to Ernst Koch & Co. Inner cooling system on drawing die drums. 4,050,282, Cl. 72-286.000.
Hess, Bernhard; and Raichle, Karl, to Bayer Aktiengesellschaft. Hardenable moulding compositions containing a thermoplastic polymer a copolymerizable vinyl compound and a polyesterurethane. 4,051,085, Cl. 260-16.000.
Hess, Jurgen: *See*—
Adalbert, Gerhard; Hess, Jurgen; and Hecht, Ulrich, 4,050,263, Cl. 62-243.000.
Hesse, Karl-Heinz: *See*—
Ruhnau, Gerhard; Gudat, Wolfgang; Liermann, Peter; and Hesse, Karl-Heinz, 4,050,747, Cl. 303-95.000.
Hetzel, Hartmut: *See*—
Grigat, Ernst; and Hetzel, Hartmut, 4,051,212, Cl. 264-102.000.
Heuvelmans, Jean Johan: *See*—
van der Werf, Jan Evert; Heuvelmans, Jean Johan; and van Tongeren, Hendricus Franciscus Johannes Jacobus, 4,051,407, Cl. 315-106.000.
Hewlett-Packard Company: *See*—
Welsh, Paul Bryce, 4,050,911, Cl. 55-197.000.
Hickok, William Kelsey: *See*—
Metzger, Lenard M.; and Hickok, William Kelsey, 4,051,515, Cl. 358-8.000.
Higgins, David M., to Comptex, Inc. Bagging machine. 4,050,219, Cl. 53-183.000.
Higuchi, Hisashi: *See*—
Imanari, Mamoru; Takeuchi, Makoto; Shimizu, Shozo; and Higuchi, Hisashi, 4,051,429, Cl. 324-.50A.
Hikasa, Tadashi: *See*—
Shiga, Shujiro; Katsumata, Takeshi; Okamoto, Yasushi; and Hikasa, Tadashi, 4,051,225, Cl. 423-235.000.
Hilbert, Francis H.; and Rzeszewski, Theodore S., to Matsushita Electric Company of America. Auxiliary signal processing circuit for television receivers. 4,051,532, Cl. 358-142.000.
Hildebrandt, William J., to Stanley Works, The. Power boring bits. 4,050,841, Cl. 408-213.000.
Hile, John W., to General Motors Corporation. Ion implanted zener diode. 4,051,504, Cl. 357-13.000.
Hill, James David: *See*—
Carmichael, John Michael; Hill, James David; and West, Donald Lee, 4,050,564, Cl. 197-1.00R.
Himuro, Masami: *See*—
Takeuchi, Kouichi; Itoh, Norio; Koyama, Kuniyoshi; Shimada, Satoshi; and Himuro, Masami, 4,051,513, Cl. 358-60.000.
Hines, Clyde Kenneth; Long, Everett James; and Wysocki, Lawrence Eugene, to Everett/Charles, Inc. Telescoping spring probe having separate wiper contact member. 4,050,762, Cl. 339-108.0TP.
Hiraishi, Hisashi: *See*—
Murakami, Shinichi; Akamatsu, Katsutaro; and Hiraishi, Hisashi, 4,050,927, Cl. 75-122.000.
Murakami, Shinichi; Akamatsu, Katsutaro; Morichika, Toshiaki; and Hiraishi, Hisashi, 4,050,929, Cl. 75-171.000.
Hiramoto, Seigo: *See*—
Shimada, Wataru; and Hiramoto, Seigo, 4,050,958, Cl. 148-9.500.
Hiratsuka, Kosai: *See*—
Nakazato, Norio; Hiratsuka, Kosai; and Furukawa, Tokinobu, 4,050,953, Cl. 127-60.000.
Hirose, Fumio: *See*—
Ohtsuka, Shigeto; Ueno, Saburo; Yoshikumi, Chikao; Hirose, Fumio; Ohmura, Yoshio; Wada, Toshihiko; Fujii, Takayoshi; and Takahashi, Eiichi, 4,051,314, Cl. 536-1.000.
Hirose, Masahiko: *See*—
Ogawa, Kazuyuki; Hirose, Masahiko; Yada, Masaaki; and Imamura, Hitoshi, 4,051,382, Cl. 250-531.000.
Hitachi, Ltd.: *See*—
Fujinawa, Masaaki; Takeyasu, Kiyoo; Iizuka, Kenichi; Uchida, Motokazu; and Uzuhashi, Hideo, 4,051,417, Cl. 318-138.000.
Hashimoto, Masahiro; and Furumaya, Kenichi, 4,051,461, Cl. 364-900.000.
Horie, Noboru, 4,051,506, Cl. 357-55.000.
Imai, Kunio, 4,051,428, Cl. 323-4.000.
Inose, Fumiyuki; Fujikata, Kenji; and Yokozawa, Norio, 4,051,457, Cl. 340-146.3MA.
Inoue, Hajime; Harada, Fumio; Kato, Kazunobu; and Oikawa, Syoji, 4,051,001, Cl. 204-151.000.
Kaneko, Kenji; and Okabe, Takahiro, 4,051,389, Cl. 307-291.000.
Kataoka, Hiroyuki; Yahiro, Seinosuke; and Suzuki, Kazuo, 4,050,547, Cl. 187-29.00R.
Nakazato, Norio; Hiratsuka, Kosai; and Furukawa, Tokinobu, 4,050,953, Cl. 127-60.000.
Seki, Kunio; Suzuki, Yukio; and Sakamoto, Yoshio, 4,051,443, Cl. 330-258.000.
Seno, Shougo; Toyama, Tatsuro; Takai, Teruo; and Ueda, Yasuomi, 4,051,550, Cl. 361-402.000.
Shimada, Satoshi; Yamada, Kazuji; Matsuda, Yasumasa; Kimura, Ichiro; Shimazoe, Michitaka; and Takahashi, Yukio, 4,050,313, Cl. 73-398.0AR.
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Suzuki, Nobuyuki; and Nishihara, Toyotaro, 4,051,514, Cl. 358-65.000.
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Nakanishi, Tetsuichiro, 4,050,252, Cl. 60-641.000.

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Yasuhiro, Ikuta; and Hitomi, Shimo, 4,050,429, Cl. 123-119.00A.

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Heissler, Herbert; Hitsch, Eckart; and Scheer, Wolfgang, 4,050,997, Cl. 204-28.000.

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Hoare, Robert C., to Allied Chemical Corporation. Anthraquinone dyes. 4,051,155, Cl. 260-379.000.

Hobbs, Jim F.; and Smyser, Craig, to Shirco, Ltd. Incineration apparatus. 4,050,900, Cl. 23-277.00R.

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Arndt, Erhard; Brodmann, Nikolaus; and Roser, Horst R., 4,050,984, Cl. 176-60.000.

Hocker, Lon O.: *See*—
Dewey, C. Forbes, Jr.; and Hocker, Lon O., 4,051,371, Cl. 250-339.000.

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Peck, John F.; and Hodges, Carl N., 4,050,443, Cl. 126-270.000.

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Takematsu, Tetsuo; Konnai, Makoto; Isogawa, Takayuki; and Kodama, Koshiro, 4,050,920, Cl. 71-88.000.

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Rebsdat, Siegfried; Mayer, Sigmund; and Alfranseder, Josef, 4,051,068, Cl. 252-412.000.
Stroszynski, Joachim, 4,050,410, Cl. 118-410.000.

Hoefler, Andrew Charles: *See*—
Sanderson, Gary Warner; Hoefler, Andrew Charles; Graham, Harold Nathaniel; and Coggon, Philip, 4,051,264, Cl. 426-52.000.

Hoerauf, Werner: *See*—
Kissel, Ernst; Neumann, Eckart; Guenther, Ernst; Valentin, Guenter; and Hoerauf, Werner, 4,051,113, Cl. 260-78.00L.

Hoesch Werke Aktiengesellschaft: *See*—
Gantke, Franz; Walter, Harald; and Zywietz, Walter, 4,050,212, Cl. 52-726.000.

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Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 4,051,319, Cl. 542-413.000.
Cohen, Noal; and Saucy, Gabriel, 4,051,153, Cl. 260-345.500.
Stoller, Hansjorg; and Wagner, Hans Peter, 4,051,174, Cl. 560-234.000.

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Mayer, Karl Heinrich; Petersen, Siegfried; Klauke, Erich; Hoffmeister, Friedrich; and Wuttke, Wolfgang, 4,051,252, Cl. 424-273.00P.

Hoffmeyer, Uwe: *See*—
Steeg, Emil; and Hoffmeyer, Uwe, 4,050,223, Cl. 53-381.00R.

Hofmann, Dionys, to Gebr. Hofmann KG, Maschinenfabrik. Apparatus for compensating for unbalance of a rotary body. 4,050,195, Cl. 51-169.000.

Hofmann, Pierre: *See*—
Cappel, Fred; Hastik, Walter; Fleming, Georg; and Hofmann, Pierre, 4,050,924, Cl. 75-5.000.

Holbert, Marvin Lee, Jr.: *See*—
Coone, Malcolm G.; Malone, Billy C.; and Holbert, Marvin Lee, Jr., 4,050,731, Cl. 294-86.240.

Holik, Melville J.; and Kraemer, John F., to International Minerals & Chemical Corporation. Foundry core composition of aggregate and a binder therefor. 4,051,092, Cl. 260-29.300.

Holleboom, Bruce W., to General Motors Corporation. Air-fuel ratio control system. 4,050,425, Cl. 123-119.0EC.

Hollenberg, Glenn W.: *See*—
Sharpe, William N., Jr.; and Hollenberg, Glenn W., 4,050,818, Cl. 356-32.000.

Hollett, Reginald; and Potter, James Charles, to CAV Limited. Liquid fuel injection pumping apparatus. 4,050,437, Cl. 123-139.0AC.

Holliday, Carl F., to Holliday Guidance Systems, Inc. Pontoon boat guidance system. 4,050,398, Cl. 115-18.00R.

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Holliday, Carl F., 4,050,398, Cl. 115-18.00R.

Hollins, James E., to Ford Motor Company. Carburetor automatic choke construction. 4,050,427, Cl. 123-119.00F.

Holloway Farm Supply, Inc.: *See*—
Cartwright, Dwayne L., 4,050,944, Cl. 106-19.000.

Holloway, John Ambrose, to B. F. Goodrich Company, The. Injection moldable polyurethanes. 4,051,111, Cl. 260-75.0NP.

Holzapfel, Immanuel, to Daimler-Benz Aktiengesellschaft. Film evaporating combustion chamber. 4,050,238, Cl. 60-39.230.

Holzman, Allen L.; and Corcoran, William J., to United States of America, Navy. Combination solid fuel ramjet injector/port cover. 4,050,243, Cl. 60-245.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Takahashi, Shuichi, 4,051,419, Cl. 318-227.000.

Honda, Kenji: *See*—
Senoo, Tadao; and Honda, Kenji, 4,050,230, Cl. 57-149.000.

Honda, Masahiro: *See*—
Asano, Toyohide; and Honda, Masahiro, 4,050,278, Cl. 72-257.000.

Honeycomb Systems, Inc.: *See*—
Bryand, Edward T., 4,050,131, Cl. 29-121.300.

Honeywell Inc.: *See*—
Dukich, Peter P.; Metzger, Isaac W.; and Volk, John A., 4,051,534, Cl. 358-210.000.
Huang, Jack S. T., 4,051,464, Cl. 340-173.00R.
Nelson, Lorne W., 4,050,291, Cl. 73-38.000.

Honma, Tsutomu: *See*—
Wakana, Hiroshi; Harada, Isamu; and Honma, Tsutomu, 4,050,605, Cl. 220-5.00A.

Hoogovens Ijmuiden BV: *See*—
Kooy, Albertus Adrianus; and van Rijkom, Jacobus, 4,051,213, Cl. 264-109.000.

Hooker Chemicals & Plastics Corporation: *See*—
Gouinlock, Edward V., Jr.; and Rosenfeld, Jerold C., 4,051,106, Cl. 260-47.00C.
Pawlak, Joseph A.; Lemper, Anthony L.; and Pattison, Victor A., 4,051,107, Cl. 260-47.00C.
Shepard, Alvin F.; and Dannels, Bobby F., 4,051,189, Cl. 260-619.00A.

Hooker, Marvin L., Jr., to Rockwell International Corporation. Input tracking threshold detector. 4,051,473, Cl. 343-7.00A.

Hoover, Carl W., Jr.: *See*—
Feingold, Robert M.; Hoover, Carl W., Jr.; and Rennie, John, 4,051,403, Cl. 313-105.0CM.

Hope, Frederick John Charles; and Pigney, James Malcolm, to Hope Technical Developments Limited. Manually operated control valve and testing apparatus incorporating such valve. 4,050,298, Cl. 73-121.000.

Hope Technical Developments Limited: *See*—
Hope, Frederick John Charles; and Pigney, James Malcolm, 4,050,298, Cl. 73-121.000.

Hopkins, John Root; Renn, Robert Maurice; and Southard, Robert Keith, to AMP Incorporated. Intrinsic certification assembly technique for wiring components into an electrical apparatus. 4,050,764, Cl. 339-103.00M.

Hori, Toshio; and Nakagawa, Tadao, to Nisshin Kogyo Kabushiki Kaisha. Disc brake device for motorcycles and the like. 4,050,549, Cl. 188-72.800.

Horie, Noboru, to Hitachi, Ltd. Complementary semiconductor device. 4,051,506, Cl. 357-55.000.

Horowitz, Carl; Dichter, Michael; and Shah, Navinchandra Bhogilal, to Polygulf Associates. Adhesive bonding. 4,051,090, Cl. 260-23.70M.

Horwinski, Elwood R., to Automobile Corporation of America. Grate and stove heating unit. 4,050,441, Cl. 126-121.000.

Hossle, Ludwig. Sacrificial anodes for cathodic protection. 4,051,007, Cl. 204-197.000.

Hotton, Joseph G., to Neumann Engraving Company. Method of welding plastic seams. 4,051,218, Cl. 264-248.000.

Houtman, John L.: *See*—
Ference, Edward W.; Houtman, John L.; and Waldby, Robert N., 4,050,986, Cl. 176-61.000.

Hovy, Jan Willem: *See*—
Dahm, Johann; Borck, Joachim; Wild, Albrecht; and Hovy, Jan Willem, 4,051,250, Cl. 424-272.000.

Howlett, Richard Martin: *See*—
Elliott, John Scotchford; Davis, Bryan Terence; and Howlett, Richard Martin, 4,051,049, Cl. 252-51.50A.

Hsieh, Henry L.: *See*—
Udipi, Kishore; and Hsieh, Henry L., 4,051,199, Cl. 260-880.00R.

Hsu, Ming Ching. Electric-powered adjustable rear-view mirror for vehicles with disengageable worm gear. 4,050,776, Cl. 350-289.000.

Huang, Jack S. T., to Honeywell Inc. Semiconductor memory cell. 4,051,464, Cl. 340-173.00R.

Huang, Wann-Sheng: *See*—
Wu, Ching H.; Brown, Alfred; Huang, Wann-Sheng; and Shum, Yick-Mow, 4,050,513, Cl. 166-274.000.

Hubbard, S. Eugene; and Biebuyck, Lawrence F., to Kawneer Company, Inc. Wall construction having a continuous sill with gutter means. 4,050,201, Cl. 52-97.000.

Hubbs, Robert J., to Raymond Lee Organization, Inc., The, a part interest. Revolver gun. 4,050,174, Cl. 42-59.000.

Huber, Reinhold: *See*—
Bertschmann, Silvio; Koester, Waldemar; and Huber, Reinhold, 4,050,207, Cl. 52-396.000.

Huber, Theodor: *See*—
Wagensonner, Eduard; Huber, Theodor; and von Fischern, Bernhard, 4,050,795, Cl. 352-141.000.

Huckaba, Charles E.: *See*—
Castellana, Frank S.; Byrne, John C.; and Huckaba, Charles E., 4,050,449, Cl. 128-2.00S.

Hughes, Raymond H.; and Clay, Carl D., to Marathon Oil Company. Transporting heavy fuel oil as a slurry. 4,050,742, Cl. 302-66.000.

Hugin Kassaregister AB: *See*—
Englund, Sven, 4,051,349, Cl. 235-130.00R.

Huiet, George E., Jr. Liquids separating system. 4,051,030, Cl. 210-114.000.

Humberstone, John; Deal, William L.; and Edgington, Arthur E., to Harbor Products, Inc. Diaphragm and method of making. 4,050,358, Cl. 92-103.00F.

Humbert, Daniel: *See—*
Hardy, Michel; and Humbert, Daniel, 4,051,249, Cl. 424-270.000.
Hunter, Charles A., II: *See—*
Morrow, James G., Sr.; Pech, David J.; Hunter, Charles A., II; and Porubcansky, Kenneth J., 4,050,586, Cl. 212-59.00R.
Hunter, Lee. Vehicle lifting jack assembly. 4,050,545, Cl. 187-8.430.
Huse, Henry, to Atlantic Fluidics, Inc. Solar energy collection system. 4,050,445, Cl. 126-271.000.
Hutchinson, John L.: *See—*
Hazdra, James J.; Rausch, David J.; and Munninger, Karl O., 4,051,040, Cl. 210-321.00B.
Hutchinson-Mapa: *See—*
de Massacre, Guy, 4,050,144, Cl. 29-427.000.
Hutson, Clifford L. Apparatus for handling delicate articles such as silicon wafers. 4,050,729, Cl. 294-64.00R.
Hydro Products, Inc.: *See—*
Laikin, Milton; and Hatchett, George L., 4,051,523, Cl. 358-99.000.
Hynst, Karel, to Adamovske strojirny, narodni podnik. Arrangement for generating a rocking motion of a transfer cylinder of an inking system. 4,050,383, Cl. 101-349.000.
I'Anson, Thomas. Pintle-type industrial conveyor chain. 4,050,323, Cl. 74-251.00C.
Ichiki, Toshio: *See—*
Gunjima, Tomoki; and Ichiki, Toshio, 4,051,002, Cl. 204-180.00P.
Ichimaru, Hiroshi: *See—*
Kashiwara, Teruo; and Ichimaru, Hiroshi, 4,050,539, Cl. 181-280.000.
ICI Australia Limited: *See—*
Barnett, George Henry, 4,050,970, Cl. 149-88.000.
Idel, Vladimir Viktorovich. Method of setting saw teeth and device for realization thereof. 4,050,333, Cl. 76-112.000.
Iguchi, Shozo: *See—*
Takahashi, Toshiro; Nagano, Toshihiro; Iguchi, Shozo; Kikuchi, Masaru; Nakamura, Katsuhiko; and Mochizuki, Atsushi, 4,050,142, Cl. 29-403.000.
Iida, Yozo; Akasaka, Shigeo; and Kawahara, Yasuhito, to Nippon Kogaku K.K. Remote control camera. 4,051,496, Cl. 354-219.000.
Iizuka, Kenichi: *See—*
Fujinawa, Masaaki; Takeyasu, Kiyoo; Iizuka, Kenichi; Uchida, Motokazu; and Uzuhashi, Hideo, 4,051,417, Cl. 318-138.000.
Ikeda, Teppei: *See—*
Takeda, Keiji; Murata, Masataka; and Ikeda, Teppei, 4,050,936, Cl. 96-28.000.
Ikeda, Toshimitu: *See—*
Ueda, Yasuo; Kamezawa, Yasutoki; Aizawa, Tatsuo; and Ikeda, Toshimitu, 4,051,052, Cl. 252-62.10L.
Ikeno, Hitoshi; Sugita, Mitsuyuki; and Yanagi, Hirofumi, to Kabushiki Kaisha Seikosha. Method for adjusting frequency-temperature characteristic of GT cut quartz oscillator. 4,050,126, Cl. 29-25.350.
Imai, Kunio, to Hitachi, Ltd. Current control circuit with current proportional circuit. 4,051,428, Cl. 323-4.000.
Imamura, Hitoshi: *See—*
Ogawa, Kazuyuki; Hirose, Masahiko; Yada, Masaaki; and Imamura, Hitoshi, 4,051,382, Cl. 250-531.000.
Imanari, Mamoru; Takeuchi, Makoto; Shimizu, Shozo; and Higuchi, Hisashi, to Nihon Denshi Kabushiki Kaisha. Nuclear magnetic resonance apparatus. 4,051,429, Cl. 324-.50A.
IMC Chemical Group, Inc.: *See—*
Shipchandler, Mohammed T., 4,051,128, Cl. 260-239.570.
Imperial Chemical Industries Limited: *See—*
Andrew, Herbert Francis; Stead, Cecil Vivian; and Thompson, Ronald, 4,051,175, Cl. 260-502.500.
Barr, Dennis Arthur; and Rose, John Brewster, 4,051,109, Cl. 260-49.000.
Caunt, Anthony David; and Fortuin, Michael Stanley, 4,051,307, Cl. 526-77.000.
Swallow, Douglas Lintin, 4,051,256, Cl. 424-304.000.
Inada, Masami; Kawabata, Yasuhiro; Sato, Katsujiro; and Osanai, Akinori, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Ignition timing adjusting device for internal combustion engines. 4,050,423, Cl. 123-117.00A.
Inata, Hiroo: *See—*
Kuratsuji, Takatoshi; Inata, Hiroo; and Kawase, Shoji, 4,051,112, Cl. 260-75.00T.
Independent Broadcasting Authority: *See—*
Baldwin, John Lewis Edwin, 4,051,531, Cl. 358-140.000.
Industrie Pirelli Societa per Azioni: *See—*
Ferrentino, Antonio; Brovedan, Antonio; and Sala, Angelo, 4,050,867, Cl. 425-114.000.
Ing. C. Olivetti & C., S.p.A.: *See—*
Badagnani, Guido; and Carioli, Giancarlo, 4,051,326, Cl. 179-2.0DP.
Ingenieur, Kurt Murrle, to Pforzheimer Uhren-Rohwerke Rudolf Wehner. Stepping mechanism for watches. 4,050,233, Cl. 58-58.000.
Ingersoll-Rand Company: *See—*
Buse, Frederic W., 4,050,862, Cl. 417-539.000.
Webb, Paul Dale, 4,050,701, Cl. 277-125.000.
Inglis, James M. Magnification of television images. 4,051,535, Cl. 358-231.000.
Inose, Fumiyuki; Fujikata, Kenji; and Yokozawa, Norio, to Hitachi, Ltd. System for generating a character pattern. 4,051,457, Cl. 340-146.3MA.
Inoue, Hajime; Harada, Fumio; Kato, Kazunobu; and Oikawa, Syoji, to Hitachi, Ltd. Process for regenerating etching solution. 4,051,001, Cl. 204-151.000.
Inoue, Nobuyoshi; and Saito, Toshihisa, to Copal Company Limited. Built-in self-timer for cameras. 4,051,501, Cl. 354-239.000.
Institoris, Laszlo: *See—*
Guczoghy, Lajos; Pfliegel, Todor; Puklics, Maria; Institoris, Laszlo; and Seres, Jeno, 4,051,156, Cl. 260-393.000.
Institut Francais du Petrole: *See—*
Cholet, Jacques; and Layotte, Pierre-Claude, 4,050,540, Cl. 181-114.000.
Institut Francais du Petrole, des Carburants et Lubrifiants: *See—*
Dawans, Francois; and Goldenberg, Emmanuel, 4,051,172, Cl. 526-90.000.
Institute po Metaloznanie i Technologia na Metalite: *See—*
Balevski, Angel Tonchev; Nikolov, Ivan Dimov; Nenov, Dragan Iliev; and Momchilov, Emil Nikolov, 4,050,503, Cl. 164-155.000.
Institutul de Cercetari si Proiectari de Masini Agricole-ICPMA: *See—*
Duca, Mihail; Vasiliu, Dan; Demetrescu, Teodor; Cimpoias, Ion; Linca, Ion; Breazu, Stefan; Antonescu, Virgil; and Cojocaru, Iosif, 4,050,704, Cl. 280-6.00R.
Intel Corporation: *See—*
Schwartz, Samuel, 4,051,358, Cl. 364-716.000.
International Business Machines Corporation: *See—*
Abbas, Shakir Ahmed; and Dockerty, Robert Charles, 4,051,273, Cl. 427-86.000.
Basi, Jagtar S., 4,050,954, Cl. 134-2.000.
Carmichael, John Michael; Hill, James David; and West, Donald Lee, 4,050,564, Cl. 197-1.00R.
Chu, Richard C.; and Moran, Kevin P., 4,050,507, Cl. 165-1.000.
Eichelberger, Edward Baxter; Muehldorf, Eugene Igor; Walther, Ronald Gene; and Williams, Thomas Walter, 4,051,352, Cl. 364-716.000.
Esteban, Daniel J.; and Menez, Jean E., 4,051,470, Cl. 340-347.0AD.
Fox, Sidney Jared; Martin, Van Clifton; and Van Hook, Danny Allen, 4,051,538, Cl. 358-296.000.
Lee, Hua-Tung, 4,051,353, Cl. 364-716.000.
McGinnis, Bernard William; and Weidenhammer, James Amos, 4,051,541, Cl. 360-98.000.
International Engineering Company, Inc.: *See—*
Meheen, Homayoun J.; and Nielson, Farrel D. (said Farrel D. Nielson assors. to), 4,050,254, Cl. 61-39.000.
International Harvester Company: *See—*
Borrill, James L., 4,050,733, Cl. 296-28.00C.
Virtue, Eugene P.; and Lech, Richard J., 4,050,478, Cl. 137-625.660.
Windecker, Leo J., 4,051,296, Cl. 428-311.000.
International Minerals & Chemical Corporation: *See—*
Batzer, Othmer F.; and Stewart, John A., 4,051,027, Cl. 210-42.00R.
Holik, Melville J.; and Kraemer, John F., 4,051,092, Cl. 260-29.300.
International Nickel Company, Inc., The: *See—*
Crum, James Roy, 4,050,928, Cl. 75-124.000.
Gendron, Aubrey Stewart; Abe, Shinichiro; Ettel, Victor Alexander; and O'Neill, Charles Edward, 4,051,000, Cl. 204-106.000.
International Standard Electric Corporation: *See—*
Kimmich, Klaus, 4,050,411, Cl. 118-625.000.
International Telephone and Telegraph Corporation: *See—*
Acar, Ali, 4,050,477, Cl. 137-625.650.
Albanese, Damian F.; and Waer, Richard R., 4,051,472, Cl. 343-5.0PD.
Aronoff, Elihu J.; and Dhami, Kewal Singh, 4,051,003, Cl. 204-159.170.
Curley, James H., 4,050,758, Cl. 339-74.00R.
Moore, John R., 4,050,756, Cl. 339-59.00M.
Pickett, Robert B.; and Baghdady, Elie J., 4,051,438, Cl. 325-45.000.
Introtech: *See—*
Goodwin, William D., 4,051,114, Cl. 260-123.500.
in't Veld, Cornelis, to National Marine Service, Inc. Flow control vane for a skimmer-type oil boom. 4,051,038, Cl. 210-242.00S.
Inukai, Hidemori, to Nippon Electric Company, Ltd. Flip-flop accompanied by two current switches, one having a smaller current sink capability than the other. 4,051,388, Cl. 307-279.000.
Ioffe, Vladimir Fedorovich: *See—*
Lavrentiev, Konstantin Nikitich; Borisova, Natalya Isaakievna; Vasiliev, Jury Ivanovich; Rodionov, Jury Nikolaevich; Strashinsky, Vadim Konstantinovich; Ioffe, Vladimir Fedorovich; and Vyatskin, Iosif Yakovlevich, deceased, 4,051,422, Cl. 318-570.000.
Iowa State University Research Foundation, Inc.: *See—*
Fanslow, Glenn Ellsworth, 4,051,435, Cl. 324-95.000.
Ipri, Alfred C.; and Sarace, John C., to United States of America, Air Force. Simultaneous fabrication of CMOS transistors and bipolar devices. 4,050,965, Cl. 148-175.000.
Isa, Isao; Shibuya, Morioki; and Ebisawa, Makoto, to Japan Carlit Co., Ltd., The. Process for manufacturing chlorine dioxide. 4,051,229, Cl. 423-478.000.
Isaka, Ichiro: *See—*
Murakami, Masuo; Isaka, Ichiro; and Kashiwagi, Teruya, 4,051,126, Cl. 260-239.100.
Ishida, Akira: *See—*
Yamada, Shinichiro; Ishida, Akira; and Mukai, Hisakazu, 4,051,460, Cl. 364-900.000.
Ishihara, Masao: *See—*
Habu, Teiji; Ishihara, Masao; Sakamoto, Eiichi; Yamada, Hiroshi; and Kaneshige, Masaaki, 4,050,940, Cl. 96-114.500.
Ishihara, Takao; Sanpei, Kiyoji; Nabatame, Hiroshi; and Motokawa, Shoichi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Apparatus and

method for removing pitch from thermally cracked gas. 4,050,910, Cl. 55-96.000.

Ishii, Hiromichi: *See*—
Sonobe, Hiroshi; Kato, Masaaki; Matsuzawa, Hideo; Ishii, Hiromichi; and Kobayashi, Masao, 4,051,179, Cl. 260-530.00N.

Ishii, Kenshun: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Ishii, Kenshun, 4,050,103, Cl. 4-110.000.

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Nakao, Shinroku; Ishii, Yoshiyasu; and Ishii, Kenshun, 4,050,103, Cl. 4-110.000.

Ishikawa, Noboru; Nakamura, Hidehisa; Maruyama, Kazuyoshi; and Shoji, Akio, to Dainippon Ink and Chemicals, Inc. Thermosetting resin composition for powder paint comprising of a (I) polymer consisting of β-methylglycidyl (meth)acrylate, styrene, unsaturated dialkyl ester, alkylacrylate and (II) saturated aliphatic dibasic acid. 4,051,194, Cl. 260-836.000.

Ishikawa, Soji. Medical needle holder assembly and method of and apparatus for manufacturing medical needle holding assembly. 4,050,150, Cl. 29-777.000.

Ishiyama, Jiro: *See*—
Motomura, Yoshie; and Ishiyama, Jiro, 4,050,919, Cl. 71-86.000.

Isogawa, Takayuki: *See*—
Takematsu, Tetsuo; Konnai, Makoto; Isogawa, Takayuki; and Kodama, Koshiro, 4,050,920, Cl. 71-88.000.

Italiano, Victor J.: *See*—
Crump, Leslie L.; and Italiano, Victor J., 4,050,569, Cl. 197-120.000.

Itek Corporation: *See*—
Ebner, Peter R.; and Griffith, Louis E., 4,051,486, Cl. 354-7.000.

Ito, Isao; and Karita, Yoichi, to NGK Insulators, Ltd. Radioactive matter containing waste gas treating installation. 4,050,638, Cl. 241-222.000.

Ito, Yoichiro, to United States of America, Health, Education and Welfare. Preparative countercurrent chromatography with a slowly rotating helical tube array. 4,051,025, Cl. 210-31.00C.

Ito, Yoshio; Ariga, Masao; and Suda, Masashi, to Canon Kabushiki Kaisha. Separator device in a copying machine. 4,050,691, Cl. 271-124.000.

Itoh, Hisaaki: *See*—
Shimomura, Raiji; Habu, Toru; Itoh, Hisaaki; Sakai, Naomi; and Goto, Tatsuo, 4,050,293, Cl. 73-105.000.

Itoh, Norio: *See*—
Takeuchi, Kouichi; Itoh, Norio; Koyama, Kuniyoshi; Shimada, Satoshi; and Himuro, Masami, 4,051,513, Cl. 358-60.000.

Itou, Michihisa: *See*—
Nakamura, Yasushi; Itou, Michihisa; and Uchimura, Mitsuo, 4,050,960, Cl. 148-16.000.

ITT Industries, Incorporated: *See*—
Belart, Juan, 4,050,748, Cl. 303-114.000.

Iverson, Myren L.: *See*—
Giles, Michael K.; and Iverson, Myren L., 4,051,364, Cl. 250-199.000.

Iwanaga, Yoshiharu: *See*—
Koizumi, Yutaka; and Iwanaga, Yoshiharu, 4,050,812, Cl. 355-66.000.

Iwase, Koji: *See*—
Nakaoka, Kazuhide; Araki, Kenji; Iwase, Koji; Koike, Yasuo; and Fukunaka, Shiro, 4,050,959, Cl. 148-12.300.

Iwema Forpacknings AB: *See*—
Stenberg, Folke Gustav Adolf, 4,050,216, Cl. 53-14.000.

Izumi, Kazuo; and Izumi, Kazuto, to Nippon Telegraph and Telephone Public Corporation. Multiplex digital echo suppression system. 4,051,332, Cl. 179-170.200.

Izumi, Kazuto: *See*—
Izumi, Kazuo; and Izumi, Kazuto, 4,051,332, Cl. 179-170.200.

Izumisawa, Yoshiaki: *See*—
Kimura, Tsuneo; Hashizume, Hiroshi; and Izumisawa, Yoshiaki, 4,051,178, Cl. 260-524.00R.

J. I. Case Company: *See*—
Golobay, Gary L., 4,051,416, Cl. 318-85.000.
Ralston, Harold A.; and Christensen, Alton B., 4,050,522, Cl. 172-311.000.

J. M. Huber Corporation: *See*—
Takewell, Robert B.; Brandon, Paul W.; and Odom, Paul R., 4,050,869, Cl. 425-222.000.

Jablin, Richard. Slag waste heat boiler. 4,050,884, Cl. 432-29.000.

Jabs, Gert; and Loew, Gunther, to Bayer Aktiengesellschaft. Process for making hydrophilic polyurethane foams. 4,051,081, Cl. 260-2.5AD.

Jaccard, Roland, to Ciba-Geigy Corporation. Process for the conversion of liquid phases of non-metallic substances, especially polymerizable or crystallizable substances, into solid phases. 4,051,208, Cl. 264-5.000.

Jackson, Harold Ernest, to Tecalemit Limited. Fuel injection systems for internal combustion engines. 4,050,431, Cl. 123-139.0AW.

Jackson, Robert Andrew, III; and Willis, Harry G., to Motorola, Inc. Zero-insertion-withdrawal force connector. 4,050,759, Cl. 339-75.00M.

Jackson, Robert R., to Owens-Corning Fiberglas Corporation. Method and apparatus for advancing strand. 4,050,639, Cl. 242-18.00G.

Jacobs, Eli S.: *See*—
Russell, James T., 4,050,811, Cl. 355-46.000.

Jaeger, Kurt S.: *See*—
Bond, Desmond H.; Taggart, George W.; and Jaeger, Kurt S., 4,051,231, Cl. 423-659.000.

Jaffrey Fire Protection Company, Inc.: *See*—
Leach, Paul A., 4,050,857, Cl. 417-309.000.

Jaggi, Hans; and Heimgartner, Hans, to Haeny & Cie AG. Apparatus for controlling a fluid medium. 4,050,356, Cl. 91-306.000.

James Neill Holdings Limited: *See*—
Wooldridge, John, 4,050,661, Cl. 248-285.000.

Jamieson, Allan Geoffrey; Samuelson, Hans Olof; Smedman, Leif Ake; and Sondell, Kent Ivar, to Mo och Domsjo Aktiebolag. Process for the delignification of lignocellulosic material by maintaining a concentration of carbon monoxide in the presence of oxygen and alkali. 4,050,981, Cl. 162-37.000.

Janin, Andre. Rotary cutting tool. 4,050,842, Cl. 408-226.000.

Janousek, Jan: *See*—
Brozkova, Marie; Burysek, Frantisek; Janousek, Jan; Mikulecky, Karel; and Skoda, Stanislav, 4,050,226, Cl. 57-34.00R.

Janssen, Almuth, heir: *See*—
Gelbein, Abraham P.; Janssen, Paul, deceased; and Richtzenhain, Hermann, 4,051,140, Cl. 260-290.00P.

Janssen, Paul, deceased: *See*—
Gelbein, Abraham P.; Janssen, Paul, deceased; and Richtzenhain, Hermann, 4,051,140, Cl. 260-290.00P.

Japan Atomic Energy Research Institute: *See*—
Takeshita, Isao, 4,051,369, Cl. 250-321.000.

Japan Carlit Co., Ltd., The: *See*—
Isa, Isao; Shibuya, Morioki; and Ebisawa, Makoto, 4,051,229, Cl. 423-478.000.

Jarman, Alonzo B.: *See*—
Zeuner, Kenneth W.; and Jarman, Alonzo B., 4,050,596, Cl. 214-131.00A.

Jauch, Christian M. J., to Spartus Corporation. Clock having ornamental pendulum with adjustable period. 4,050,236, Cl. 58-132.000.

Javan, Ali; and Davis, Charles F., Jr., to Massachusetts Institute of Technology. Computer memory. 4,051,462, Cl. 340-173.0LT.

Jayne, Gerald John Joseph: *See*—
Elliott, John Scotchford; Jayne, Gerald John Joseph; Askew, Herbert Frank; and Harrington, Colin John, 4,051,053, Cl. 252-78.300.

Jean Walterscheid GmbH: *See*—
von Allworden, Wilhelm, 4,050,715, Cl. 280-508.000.

Jelenko, Carl, III. Topical veterinary dermatological medicament. 4,051,257, Cl. 424-312.000.

Jennings, Martin C. Container spillage prevention system. 4,050,600, Cl. 215-11.00R.

Jensen, Harry: *See*—
Drostholm, Frede Hilmar; Jensen, Harry; and Willadsen, Per, 4,050,865, Cl. 425-183.000.

Jero, John P.: *See*—
Bjerk, Roger O.; Brandon, William D.; Engelking, Frederick S.; and Jero, John P., 4,051,100, Cl. 260-42.180.

Jester, Willi; and Tack, Hans, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Milling cutter. 4,050,129, Cl. 407-45.000.

Jidai, Eiki: *See*—
Shibayama, Kyoichi; Ono, Hiroshi; Jidai, Eiki; and Fujii, Akira, 4,051,091, Cl. 260-29.2TN.

Jilla, Dara Ardeshir, to Martin Processing Co., Inc. Coloring polyester materials with acid dyes. 4,050,892, Cl. 8-4.000.

Johansen, Johan Peter: *See*—
Van Sluis, Jan Adolf; Reinhart, Frans Remko; Johansen, Johan Peter; and Pedersen, Rolf, 4,050,467, Cl. 131-147.00A.

Johansson, Carl-Gustaf: *See*—
Tuvesson, Par-Ake; and Johansson, Carl-Gustaf, 4,050,703, Cl. 277-207.00A.

John D. Holligsworth on Wheels, Inc.: *See*—
Freeman, Joseph L., 4,050,119, Cl. 19-106.00R.

John O. Butler Company: *See*—
Tisma, Stevan, 4,050,648, Cl. 242-129.800.

John Wyeth & Brother Limited: *See*—
Curran, Adrian Charles Ward, 4,051,139, Cl. 260-290.0HL.

Johnson, Arthur F., to R.C.M. Corporation. Process for the production and use of activated alumina in refining steel. 4,050,925, Cl. 75-30.000.

Johnson, Arthur F., to R.C.M. Corporation. Process for the production and use of activated alumina to produce aluminum. 4,050,999, Cl. 204-67.000.

Johnson, Arthur L.: *See*—
Boschen, William O.; Annichiarico, Angelo V.; and Johnson, Arthur L., 4,051,035, Cl. 210-220.000.

Johnson, Frank W. Rod butt with integral reel seat. 4,050,179, Cl. 43-22.000.

Johnson, James A., to UOP Inc. Method for loading finely divided particulate matter into a vessel. 4,051,019, Cl. 208-146.000.

Johnson, Richard Servern: *See*—
Davies, Michael LaVar; Johnson, Richard Servern; Noker, Alvin John; and Wilde, Veldon Lawrence, 4,050,568, Cl. 197-90.000.

Johnson, Robert E., to Sterling Drug Inc. 1-(Arylamino)-and 1-(arylimino)-pyrroles. 4,051,147, Cl. 260-326.470.

Johnson, Roy W. P., to Tower Technology, Inc. Method of erecting a tower structure. 4,050,214, Cl. 52-745.000.

Johnston, John R.: *See*—
Coleman, Ronald J., 4,050,671, Cl. 254-7.00R.

Jonathan Systems: *See*—
Healy, James W.; and Currier, Bob L., 4,051,522, Cl. 358-86.000.

Jonda, Wolfgang, to Messerschmitt-Bolkow-Blohm G.m.b.H. Force transmitting structural member. 4,050,827, Cl. 403-11.000.

Jones, Donald Keith: *See*—
Bogue, Robert Edgar; Jones, Donald Keith; Riggs, Ray Vere; and Vogele, Bruno Joseph, 4,050,655, Cl. 244-137.00R.

Jones, Henry B.: *See*—
Bunn, Dorrance P., Jr.; Williams, Dale; Jones, Henry B.; and MacLean, John P., 4,051,069, Cl. 252-417.000.
Jones, Howard S., Jr.: *See*—
Reggia, Frank; and Jones, Howard S., Jr., 4,051,480, Cl. 343-705.000.
Jones & Laughlin Steel Corporation: *See*—
Butler, John F., 4,051,270, Cl. 427-8.000.
Jones, Marvin H.: *See*—
Thomas, Robert J.; and Jones, Marvin H., 4,050,327, Cl. 74-502.000.
Jones, Noel C., to Noel C. Jones & Associates, Inc. Apparatus for repairing indentions in a rigid skin. 4,050,271, Cl. 72-37.000.
Jones, Trevor D.: *See*—
Kwolek, John P.; Urso, William G.; and Jones, Trevor D., 4,050,620, Cl. 228-162.000.
Jongeling, Herman, to D.E.J. International Research Company B.V. Process for stabilizing tea extract and product. 4,051,267, Cl. 426-330.300.
Jordan, Lawrence E.: *See*—
Stanwick, Casmer P.; and Jordan, Lawrence E., 4,051,399, Cl. 310-51.000.
Jordan, Ruth Frances. Support harness. 4,050,737, Cl. 297-389.000.
Jorwa, Mildred M. Self-styling and utility mirror with four surfaces. 4,050,790, Cl. 350-305.000.
Joy Manufacturing Company: *See*—
Turner, John W.; and McLaughlin, Russell A., 4,050,300, Cl. 73-139.000.
Juneja, Prem Sagar: *See*—
Gieske, Henry Anthony; and Juneja, Prem Sagar, 4,051,234, Cl. 424-52.000.
Junghans, Klaus, to Schering Aktiengesellschaft. Electrolytic reduction of aromatic steroids. 4,050,998, Cl. 204-59.00R.
Junkert, Kenneth G.; and Voznick, Henry P., to William Wahl Corporation. Method and apparatus for measuring temperature. 4,050,309, Cl. 73-362.0AR.
Jurasek, Stanley J., to Eagle Picher Industries, Inc. Collapsible material handling container. 4,050,606, Cl. 220-7.000.
Jutte, Ralph B.; and Lehman, Roger L., to Owens-Corning Fiberglas Corporation. Sink-free panels. 4,051,290, Cl. 428-168.000.
K-Krete, Inc.: *See*—
Brewer, William E.; and Zimmer, Franklin V., 4,050,258, Cl. 61-50.000.
Brewer, William E.; and Zimmer, Franklin V., 4,050,261, Cl. 61-105.000.
Brewer, William E.; and Zimmer, Franklin V., 4,050,950, Cl. 106-97.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Yoshihashi, Akira; and Yamada, Hiraku, 4,050,750, Cl. 305-54.000.
Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Suzuki, Ikuo; and Nishiyama, Shuji, 4,050,342, Cl. 84-95.00C.
Kabushiki Kaisha Seikosha: *See*—
Fujita, Masanori; and Suzuki, Sukenori, 4,050,787, Cl. 350-160.0LC.
Ikeno, Hitoshi; Sugita, Mitsuyuki; and Yanagi, Hirofumi, 4,050,126, Cl. 29-25.350.
Kabushiki Kaisha Suwa Seikosha: *See*—
Toshio, Mori, 4,050,234, Cl. 58-85.500.
K.K. Tokai Rika Denki Seisakusho: *See*—
Tanaka, Hiroshi, 4,050,272, Cl. 70-100.000.
Kai, Toshio: *See*—
Tanaka, Junzo; and Kai, Toshio, 4,051,341, Cl. 219-10.55D.
Kakinuma, Toshihide. Hem-line marker. 4,050,159, Cl. 33-9.00R.
Kalafus, Edward F.: *See*—
van Gils, Gerard E.; and Kalafus, Edward F., 4,051,281, Cl. 427-379.000.
Kalke, Henry J. Side lift for side dumping wagons. 4,050,593, Cl. 214-44.00C.
Kaloi, Cyril M., to United States of America, Navy. Notched/diagonally fed electric microstrip antenna. 4,051,478, Cl. 343-700.0MS.
Kalve, Uldis H., to Wallace Business Forms, Inc. Sealed envelope assembly with locking pockets for free insert material. 4,050,582, Cl. 206-627.000.
Kalyan, Jagdish C.; and Dickinson, Bryan J. Lubrication system for an air motor. 4,050,544, Cl. 184-6.600.
Kamezawa, Yasutoki: *See*—
Ueda, Yasuo; Kamezawa, Yasutoki; Aizawa, Tatsuo; and Ikeda, Toshimitu, 4,051,052, Cl. 252-62.10L.
Kan, Peter Tai-Yuen: *See*—
Cenker, Moses; and Kan, Peter Tai-Yuen, 4,051,082, Cl. 260-2.5AR.
Kanai, Kenji, to Matsushita Electric Industrial Co., Ltd. Magnetic head with thin sheet exhibiting magnetoresistive property. 4,051,542, Cl. 360-113.000.
Kanaya, Fumio: *See*—
Kuroda, Hideo; and Kanaya, Fumio, 4,051,530, Cl. 358-136.000.
Kanazawa, Shigenori: *See*—
Yamada, Makoto; Sasaki, Shiro; Kanazawa, Shigenori; and Hayashi, Yoshihiro, 4,050,717, Cl. 280-744.000.
Kaneko, Kenji; and Okabe, Takahiro, to Hitachi, Ltd. Flip-flop circuit. 4,051,389, Cl. 307-291.000.
Kaneko, Masakatsu: *See*—
Shimizu, Bunji; Saito, Akio; Kaneko, Masakatsu; Yanagisawa, Hiroaki; and Nakao, Hideo, 4,051,129, Cl. 544-21.000.
Kaneshige, Masaaki: *See*—
Habu, Teiji; Ishihara, Masao; Sakamoto, Eiichi; Yamada, Hiroshi; and Kaneshige, Masaaki, 4,050,940, Cl. 96-114.500.
Kang, Jung Wong; and Oziomek, James, to Firestone Tire & Rubber Company, The. Process for copolymerizing conjugated diene and alpha-olefin. 4,051,309, Cl. 526-141.000.
Kang, Jung Wong: *See*—
Lohr, Delmar Frederick, Jr.; and Kang, Jung Wong, 4,051,103, Cl. 260-45.75W.
Kanij, Johannes B. W.; Noothout, Arend J.; and Hermans, Marie E. A., to Reactor Centrum Nederland (Stichting). Method for the preparation of concentrated nitrate-deficient salt solutions. 4,051,060, Cl. 252-301.1R.
Kaplan, Nathan O., to University of California, The Regents of the. Amino-propranolol. 4,051,186, Cl. 260-570.700.
Kappler, Guenter; and Fehler, Adolf, to Motoren- und Turbinen-Union Munchen GmbH; and M.A.N. Maybach Mercedes-Benz. Thermodynamic prime mover with heat exchanger. 4,050,239, Cl. 60-39.51R.
Karis, Lyle A.: *See*—
Kohl, Robert F.; Karis, Lyle A.; and Shy, James L., 4,050,882, Cl. 432-14.000.
Karita, Yoichi: *See*—
Ito, Isao; and Karita, Yoichi, 4,050,638, Cl. 241-222.000.
Karmell, Yale, to Samuel Bingham Co. Hydrolyzed polyurethane plasticizer. 4,051,095, Cl. 260-31.8DR.
Karp, Natan. Compactable furniture. 4,050,736, Cl. 297-135.000.
Kashiwagi, Teruya: *See*—
Murakami, Masuo; Isaka, Ichiro; and Kashiwagi, Teruya, 4,051,126, Cl. 260-239.100.
Kashiwara, Teruo; and Ichimaru, Hiroshi, to Kashiwara, Teruo. Exhaust apparatus for internal combustion engine. 4,050,539, Cl. 181-280.000.
Kataoka, Hiroyuki; Yahiro, Seinosuke; and Suzuki, Kazuo, to Hitachi, Ltd. Floor controller for an elevator. 4,050,547, Cl. 187-29.00R.
Kato, Hajime: *See*—
Hayashi, Takao; and Kato, Hajime, 4,051,303, Cl. 428-411.000.
Kato Hatsujyo Co., Ltd.: *See*—
Yamaguchi, Takehisa, 4,050,120, Cl. 24-73.0HS.
Kato, Hirosi; and Fujita, Hideo, to Dainichi-Nippon Cables, Ltd. Chlorinated elastomer compositions. 4,051,078, Cl. 260-2.00A.
Kato, Kazunobu: *See*—
Inoue, Hajime; Harada, Fumio; Kato, Kazunobu; and Oikawa, Syoji, 4,051,001, Cl. 204-151.000.
Kato, Koji: *See*—
Katsumata, Takuma; Kato, Koji; Kishigami, Hisao; and Kuroda, Noriyasu, 4,050,642, Cl. 242-55.000.
Kato, Masaaki: *See*—
Sonobe, Hiroshi; Kato, Masaaki; Matsuzawa, Hideo; Ishii, Hiromichi; and Kobayashi, Masao, 4,051,179, Cl. 260-530.00N.
Kato, Taro: *See*—
Hara, Shinichi; and Kato, Taro, 4,050,390, Cl. 110-15.000.
Katoh, Yoshihisa: *See*—
Takemura, Takeshi; Katoh, Yoshihisa; Kurita, Shigeyuki; Sasaki, Susumu; Funabiki, Kyohei; and Hatano, Keizo, 4,051,098, Cl. 260-38.000.
Katsube, Hideo: *See*—
Shichida, Hiromichi; Katsube, Hideo; Oyama, Shigeaki; Toyoda, Kenichi; and Saito, Mitsuo, 4,050,837, Cl. 408-35.000.
Katsumata, Takeshi: *See*—
Shiga, Shujiro; Katsumata, Takeshi; Okamoto, Yasushi; and Hikasa, Tadashi, 4,051,225, Cl. 423-235.000.
Katsumata, Takuma; Kato, Koji; Kishigami, Hisao; and Kuroda, Noriyasu, to Mitsubishi Jukogyo Kabushiki Kaisha. Winding or rewinding film. 4,050,642, Cl. 242-55.000.
Katzman, Allison W.; and Keller, Albert G., to Marvin Glass & Associates. Arts and crafts molding device. 4,050,875, Cl. 425-429.000.
Kauffman, Ivan L.; and Kellogg, Robert C., to Monsanto Company. Rotary stretch blow molding apparatus. 4,050,876, Cl. 425-529.000.
Kaufhold, Frederick Daniel: *See*—
Ericson, Eric Axel; and Kaufhold, Frederick Daniel, 4,051,335, Cl. 200-50.0AA.
Kautz, Walter C., Jr. Pyrolytic reducer and condenser apparatus. 4,050,991, Cl. 202-99.000.
Kavtaev, Evgeny Emelyanovich: *See*—
Zaikovsky, Vladimir Borisovich; Kutuzov, Jury Prokhorovich; Zakharov, Mikhail Fedorovich; Kavtaev, Evgeny Emelyanovich; Poedinschikov, Jury Grigorievich; Bazhanov, Jury Mikhailovich; and Schapov, Valentin Andrianovich, 4,050,288, Cl. 72-468.000.
Kawabata, Yasuhiro: *See*—
Inada, Masami; Kawabata, Yasuhiro; Sato, Katsujiro; and Osanai, Akinori, 4,050,423, Cl. 123-117.00A.
Kawaguchi, Hiroshi; Tomita, Koji; Tsukiura, Hiroshi; and Konishi, Masataka, to Bristol-Myers Company. Glycopeptide antibiotics Bu-2231 A and B and process for producing same. 4,051,237, Cl. 424-117.000.
Kawahara, Yasuhito: *See*—
Iida, Yozo; Akasaka, Shigeo; and Kawahara, Yasuhito, 4,051,496, Cl. 354-219.000.
Kawasaki, Masahiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Photographic exposure meter circuit having temperature compensation. 4,051,490, Cl. 354-24.000.
Kawasaki, Masahiro: *See*—
Uno, Nayuki; Shono, Tetsuji; Urano, Fumio; Kawasaki, Masahiro; and Miyata, Katsuhiko, 4,051,503, Cl. 354-289.000.
Kawasaki, Shuichi: *See*—
Sato, Yasuhiro; Sato, Toshio; Kawasaki, Shuichi; Takaishi, Toshio; Okuyama, Sadao; and Yamanashi, Norio, 4,050,371, Cl. 99-550.000.
Kawase, Shoji: *See*—
Kuratsuji, Takatoshi; Inata, Hiroo; and Kawase, Shoji, 4,051,112, Cl. 260-75.00T.

Kawneer Company, Inc.: *See*—
Hubbard, S. Eugene; and Biebuyck, Lawrence F., 4,050,201, Cl. 52-97.000.

Kayser, Detlev: *See*—
Schacht, Erich; Mehrhof, Werner; Simane, Zdenek; Kayser, Detlev; and Nowak, Herbert, 4,051,170, Cl. 560-62.000.

Kazi, Abdulla M. Z.: *See*—
Crompton, Charles E.; and Kazi, Abdulla M. Z., 4,051,064, Cl. 252-309.000.

Keefe, Jack D., to Monarch Marking Systems, Inc. Selective printing apparatus. 4,050,376, Cl. 101-111.000.

Keiser, Dennis L. Exercising apparatus. 4,050,310, Cl. 73-379.000.

Keith, Gareth A.: *See*—
Borg, Karl S.; and Keith, Gareth A., 4,050,670, Cl. 251-14.000.

Kell, Nathaniel B., to General Motors Corporation. Transmission control with governor discontinuance control valve. 4,050,330, Cl. 74-759.000.

Keller, Albert G.: *See*—
Katzman, Allison W.; and Keller, Albert G., 4,050,875, Cl. 425-429.000.

Keller, Eduard: *See*—
Beriger, Conrad: and Keller, Eduard, 4,051,509, Cl. 357-82.000.

Kellogg, Harlan F. Shelving apparatus. 4,050,386, Cl. 108-111.000.

Kellogg, Robert C.: *See*—
Kauffman, Ivan L.; and Kellogg, Robert C., 4,050,876, Cl. 425-529.000.

Kelly, Daniel L., to Anderson Safeway Guard Rail Corporation. Raisable and lowerable surveillance camera assembly. 4,051,525, Cl. 358-108.000.

Kelly, George B., Jr.: *See*—
Williams, John C.; and Kelly, George B., Jr., 4,051,276, Cl. 427-248.00C.

Kelly, Henry W., to McCullough, Wanda, a part interest. Barricade system. 4,050,401, Cl. 116-63.00P.

Kelly, Robert George: *See*—
Lawson, Frank; Waverley, Glen; Ward, Denby Harcourt; and Kelly, Robert George, 4,050,926, Cl. 75-78.000.

Kelso Marine, Inc.: *See*—
Linam, Richard L., 4,050,647, Cl. 242-129.800.

Kemner, Rudolf; and Zonneveld, Frans Wessel, to U.S. Philips Corporation. Scanning X-ray examination apparatus. 4,051,377, Cl. 250-401.000.

Kemper, Gert; and Melzer, Roland, to Badische Maschinenfabrik GmbH. Jarring moulding machine. 4,050,505, Cl. 164-206.000.

Kemper, James M.; O'Neill, Robert J.; Wagenhals, Bruce E.; and Adams, Jack W., to Monogram Industries, Inc. Recirculating toilet system. 4,050,102, Cl. 4-10.000.

Kendall Company, The: *See*—
Samour, Carlos M.; and Richards, Mildred C., 4,051,158, Cl. 260-404.500.

Kennametal Inc.: *See*—
Kita, John F., 4,050,525, Cl. 173-17.000.
Niskanen, Karl G., 4,050,355, Cl. 90-56.00R.

Kennedy, Timothy James: *See*—
Shires, Philip John; and Kennedy, Timothy James, 4,051,268, Cl. 426-548.000.

Kent Manufacturing Co., Inc.: *See*—
Hake, Kenneth A., 4,050,524, Cl. 172-707.000.

Khalid, Syed J., to General Electric Company. Method and apparatus for measuring pressures. 4,050,306, Cl. 73-212.000.

Kikkoman Shoyu Co., Ltd.: *See*—
Motomura, Yoshie; and Ishiyama, Jiro, 4,050,919, Cl. 71-86.000.

Kikuchi, Masaru: *See*—
Takahashi, Toshiro; Nagano, Toshihiro; Iguchi, Shozo; Kikuchi, Masaru; Nakamura, Katsuhiko; and Mochizuki, Atsushi, 4,050,142, Cl. 29-403.000.

Kilgore, Lee A.; Taylor, Edgar R., Jr.; and South, William H., to Westinghouse Electric Corporation. Supervisory system for detecting torsional oscillation in the shaft of a rotating electro-mechanical system. 4,051,427, Cl. 322-99.000.

Kilsdonk, Harley, to Akzo N.V. Apparatus for melt-spinning. 4,050,866, Cl. 425-192.00S.

Kimball of Minnesota, Inc.: *See*—
Mayer, Joseph E., 4,050,627, Cl. 237-55.000.

Kimberly-Clark Corporation: *See*—
Woon, Lin-Sun; and Endres, Dan D., 4,050,462, Cl. 128-287.000.

Kimmich, Klaus, to International Standard Electric Corporation. Apparatus for marking insulated electrical conductors. 4,050,411, Cl. 118-625.000.

Kimura, Hiroshiro: *See*—
Tsuruta, Motohiro; Kimura, Hiroshiro; Koshimo, Akio; Nara, Hirohisa; Goto, Tokuju; and Amemiya, Kunio, 4,051,215, Cl. 264-137.000.

Kimura, Ichiro: *See*—
Shimada, Satoshi; Yamada, Kazuji; Matsuda, Yasumasa; Kimura, Ichiro; Shimazoe, Michitaka; and Takahashi, Yukio, 4,050,313, Cl. 73-398.0AR.

Kimura, Tsuneo; Hashizume, Hiroshi; and Izumisawa, Yoshiaki, to Mitsubishi Chemical Industries Limited. Process for producing terephthalic acid. 4,051,178, Cl. 260-524.00R.

King, Jack C. Downrigger reel and temperature indicator. 4,050,180, Cl. 43-27.400.

Kinoshita, Haruo: *See*—
Koseki, Toshinori; Maeda, Kunio; Aboshi, Michihiro; and Kinoshita, Haruo, 4,051,096, Cl. 260-31.80M.

Kircher, Morton S.: *See*—
Ford, James M.; Kircher, Morton S.; and Mosher, Hugh A., 4,051,008, Cl. 204-266.000.

Kirshenbaum, Gerald S.; and Vogelfanger, Elliot A., to Celanese Corporation. Package for light and oxygen sensitive food. 4,051,265, Cl. 426-107.000.

Kishigami, Hisao: *See*—
Katsumata, Takuma; Kato, Koji; Kishigami, Hisao; and Kuroda, Noriyasu, 4,050,642, Cl. 242-55.000.

Kissel, Ernst; Neumann, Eckart; Guenther, Ernst; Valentin, Guenter; and Hoerauf, Werner, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Extraction of polylactams. 4,051,113, Cl. 260-78.00L.

Kita, John F., to Kennametal Inc. Down-the-hole hammer. 4,050,525, Cl. 173-17.000.

Kitai, Kiyoshi, to Seiko Koki Kabushiki Kaisha. Camera electric shutter with mechanical delay device. 4,051,498, Cl. 354-234.000.

Kitamura, Nobu: *See*—
Ohkubo, Noriyoshi; and Kitamura, Nobu, 4,051,284, Cl. 428-36.000.

Klauke, Erich: *See*—
Mayer, Karl Heinrich; Petersen, Siegfried; Klauke, Erich; Hoffmeister, Friedrich; and Wuttke, Wolfgang, 4,051,252, Cl. 424-273.00P.

Kleeberg, Ulrich; Leimkuhler, Jurgen; Knospe, Jurgen; and Stohr, Manfred, to Gottfried Bischoff Bau kompl. Gasreinigungs-und Wasserruckkuhlanlagen Kommanditgesellschaft; and STEAG Aktiengesellschaft. Apparatus for making pellets usable as aggregate or filler. 4,050,871, Cl. 425-317.000.

Kleimola, Frank W., to Nucledyne Engineering Corporation. Passive containment system. 4,050,983, Cl. 176-38.000.

Klein, Elias; Smith, James K.; and Morton, Frederick C., to Gulf South Research Institute. Hollow synthetic fibers. 4,051,300, Cl. 428-398.000.

Klein, Max, to Normac, Inc. Reactor apparatus. 4,050,897, Cl. 23-252.00R.

Klein, Schanzlin & Becker Aktiengesellschaft: *See*—
Metzinger, Wolfgang; Boll, Bernd; and Hergt, Peter, 4,050,846, Cl. 415-182.000.

Kleiss, Joachim: *See*—
Brachert, Heinrich; and Kleiss, Joachim, 4,051,207, Cl. 264-3.00B.

Klemm, Kurt; and Langenscheid, Erhard, to Byk Gulden Lomberg Chemische Fabrik GmbH. Substituted N-acyl-N''-(3-amino-2-cyanoacryloyl-)formamidrazones. 4,051,242, Cl. 424-246.000.

Kline, Melbert A. Rigid saddle bag type carrier for bicycles. 4,050,615, Cl. 224-32.00A.

Klingenmaier, Otto J., to General Motors Corporation. Electochemically exchanging a steel surface with a pure iron surface. 4,050,996, Cl. 204-28.000.

Klinkmann, Kurt: *See*—
Wagner, Kuno; and Klinkmann, Kurt, 4,051,165, Cl. 260-453.0AB.

Klockner-Werke AG: *See*—
Langhammer, Hans Jurgen, 4,050,683, Cl. 266-164.000.

Kloss, Albert, to BBC Brown Boveri & Company Limited. Apparatus for overvoltage protection of a direct converter in the rotor circuit of an asynchronous machine. 4,051,545, Cl. 361-58.000.

KLT Industries, Inc.: *See*—
Knochel, Wayne L.; and Traeger, Robert S., 4,050,414, Cl. 119-1.000.

Kluge, Arthur F., to Syntex (U.S.A.) Inc. 3-(2-Dialkylamino-2-dialkylphosphonylvinyl)-6,11-dihydrodibenzo-[b.e.]-thiepin-11-one. 4,051,150, Cl. 260-327.00B.

Knapik, H. Peter G.; and Adams, Frank H., to UOP Inc. Hydrocarbon conversion with a selectively sulfided acidic multimetallic catalytic composite. 4,051,018, Cl. 208-139.000.

Kneip, Jakob. Arrangement for drilling holes to apply builders' hardware on windows. 4,050,838, Cl. 408-46.000.

Knight, Bill J. Method for casting anodes. 4,050,961, Cl. 148-32.000.

Knight, David John, to Bendix Westinghouse Limited. Load dependent control arrangements. 4,050,743, Cl. 303-22.00R.

Knoble, David W., to General Electric Company. Discharge lamp operating circuit. 4,051,410, Cl. 315-205.000.

Knoble, David W.; and Morais, Don, to General Electric Company. Discharge lamp operating circuit. 4,051,411, Cl. 315-205.000.

Knoble, David W.; and Owen, Daniel V., to General Electric Company. Discharge lamp operating circuit. 4,051,412, Cl. 315-205.000.

Knochel, Wayne L.; and Traeger, Robert S., to KLT Industries, Inc. Animal toilet. 4,050,414, Cl. 119-1.000.

Knorr-Bremse GmbH: *See*—
Pollinger, Hans; and Scheffel, Bernd, 4,050,553, Cl. 188-203.000.
Scheffel, Bernd, 4,050,554, Cl. 188-203.000.

Knorre, Helmut; Fischer, Joachim; and Pohl, Gerhard, to Deutsch Gold-und Silber-Scheideanstalt. Preventing caking and obtaining flowability of alkali chlorides and salt mixtures thereof. 4,051,228, Cl. 423-268.000.

Knospe, Jurgen: *See*—
Kleeberg, Ulrich; Leimkuhler, Jurgen; Knospe, Jurgen; and Stohr, Manfred, 4,050,871, Cl. 425-317.000.

Knupfer, Hans: *See*—
Braden, Rudolf; Knupfer, Hans; and Ziemann, Heinz, 4,051,177, Cl. 260-510.000.

Kobayashi, Kohroh, to Nippon Selfoc Company, Limited. Light beam coupler for axially discoincident optical fibers. 4,050,784, Cl. 350-96.00C.

Kobayashi, Masao: *See*—
Sonobe, Hiroshi; Kato, Masaaki; Matsuzawa, Hideo; Ishii, Hiromichi; and Kobayashi, Masao, 4,051,179, Cl. 260-530.00N.

Kobayashi, Masayoshi; and Yuzawa, Yasutaka, to Diesel Kiki Co., Ltd.

Dash pot arrangement for distribution-type fuel injection pump cut off barrel. 4,050,856, Cl. 417-289.000.
Kobiella, Robert J., to Signode Corporation. Automatic strapping machine. 4,050,372, Cl. 100-2.000.
Kodama, Koshiro: *See—*
Takematsu, Tetsuo; Konnai, Makoto; Isogawa, Takayuki; and Kodama, Koshiro, 4,050,920, Cl. 71-88.000.
Koerbacher, Kathleen C. Endotracheal tube. 4,050,466, Cl. 128-351.000.
Koester, Eberhard; Wunsch, Gerd; Schoenafinger, Eduard; and Schneehage, Henning, to BASF Aktiengesellschaft. Manufacture of ferromagnetic, acicular metallic iron particles by hydrogen reduction. 4,050,962, Cl. 148-105.000.
Koester, Waldemar: *See—*
Bertschmann, Silvio; Koester, Waldemar; and Huber, Reinhold, 4,050,207, Cl. 52-396.000.
Kohl, Robert F.; Karis, Lyle A.; and Shy, James L., to Allis-Chalmers Corporation. Dual variable orifice for reinforced preheater. 4,050,882, Cl. 432-14.000.
Kohn, Thomas F., to Belco Industries, Incorporated. Rotary oven. 4,050,889, Cl. 432-130.000.
Koike, Yasuo: *See—*
Nakaoka, Kazuhide; Araki, Kenji; Iwase, Koji; Koike, Yasuo; and Fukunaka, Shiro, 4,050,959, Cl. 148-12.300.
Koizumi, Yutaka; and Iwanaga, Yoshiharu, to Ricoh Co., Ltd. Light shield curtain assembly for reciprocating optical scanning head. 4,050,812, Cl. 355-66.000.
Komaki, Saiji. Apparatus for manufacturing concrete panels with surface pattern decorations. 4,050,864, Cl. 425-134.000.
Komine, Yoshio, to Canon Kabushiki Kaisha. Motion picture camera presenting a foldable grip. 4,050,796, Cl. 352-243.000.
Kominiak, Andrew A.: *See—*
Storck, Glenn E.; and Kominiak, Andrew A., 4,050,149, Cl. 29-630.00R.
Komori, Akito: *See—*
Takahashi, Yasuro; Fujima, Yukihisa; Oguri, Masaharu; and Komori, Akito, 4,050,879, Cl. 431-174.000.
Kondo, Toshihiro, to Kondo, Toshihiro; and Fuji Film Co., Ltd. Coil means for driving a linear motor. 4,051,398, Cl. 310-12.000.
Kondo, Toshihiro, to Kondo, Toshihiro; and Fuji Photo Film Co., Ltd. Linear motor-driven focal plane shutter. 4,051,499, Cl. 354-234.000.
Kondoh, Mitsuru, to Ricoh Co., Ltd. Facsimile receiving apparatus. 4,051,537, Cl. 358-264.000.
Koninklijke Bedrijven Theodorus Niemeyer B.V.: *See—*
Van Sluis, Jan Adolf; Reinhart, Frans Remko; Johansen, Johan Peter; and Pedersen, Rolf, 4,050,467, Cl. 131-147.00A.
Konishi, Masataka: *See—*
Kawaguchi, Hiroshi; Tomita, Koji; Tsukiura, Hiroshi; and Konishi, Masataka, 4,051,237, Cl. 424-117.000.
Konishiroku Photo Industry Co., Ltd.: *See—*
Habu, Teiji; Ishihara, Masao; Sakamoto, Eiichi; Yamada, Hiroshi; and Kaneshige, Masaaki, 4,050,940, Cl. 96-114.500.
Mayama, Masayoshi; and Miura, Kiyoyuki, 4,051,302, Cl. 428-411.000.
Konnai, Makoto: *See—*
Takematsu, Tetsuo; Konnai, Makoto; Isogawa, Takayuki; and Kodama, Koshiro, 4,050,920, Cl. 71-88.000.
Konnerth, Andrew, III. Heat reclaimer. 4,050,628, Cl. 237-55.000.
Konontsev, Valery Vasilievich: *See—*
Tagirov, Kurban Magomedovich; Akopian, Nikolai Rubenovich; Konontsev, Valery Vasilievich; and Lutsenko, Jury Nikolaevich, 4,050,529, Cl. 175-422.000.
Kooy, Albertus Adrianus; and van Rijkom, Jacobus, to Hoogovens Ijmuiden BV. Process for pressing briquettes from fine-grained fluorspar and pressed briquettes thus obtained. 4,051,213, Cl. 264-109.000.
Kopf, Wolfgang, to Daimler-Benz Aktiengesellschaft. Safety steering column for passenger motor vehicles. 4,050,326, Cl. 74-492.000.
Koppe, Rudolf P.: *See—*
Davidse, Jan; and Koppe, Rudolf P., 4,051,520, Cl. 358-22.000.
Koppers Company, Inc.: *See—*
Davies, Dan L., 4,051,282, Cl. 427-393.000.
Koreki, Jan: *See—*
Fairbairn, Geoffrey; Cooke, George Frederick; Winkworth, Reginald; and Koreki, Jan, 4,050,289, Cl. 73-1.00F.
Kornylak Corporation: *See—*
Tabler, Charles P., 4,051,209, Cl. 264-39.000.
Korous, Donald J.: *See—*
Neuzil, Richard W.; and Korous, Donald J., 4,051,192, Cl. 260-674.0SA.
Korteling, Gerrit-Jan: *See—*
Bogaard, Johan J. H.; and Korteling, Gerrit-Jan, 4,050,601, Cl. 220-2.10A.
Koseki, Toshinori; Maeda, Kunio; Aboshi, Michihiro; and Kinoshita, Haruo, to Asahi Kasei Kogyo Kabushiki Kaisha. Resin composition. 4,051,096, Cl. 260-31.80M.
Koshimo, Akio: *See—*
Tsuruta, Motohiro; Kimura, Hiroshiro; Koshimo, Akio; Nara, Hirohisa; Goto, Tokuju; and Amemiya, Kunio, 4,051,215, Cl. 264-137.000.
Kossett, Allen J., to Will Ross, Inc. Tube mold. 4,050,667, Cl. 249-82.000.
Koyama, Kuniyoshi: *See—*
Takeuchi, Kouichi; Itoh, Norio; Koyama, Kuniyoshi; Shimada, Satoshi; and Himuro, Masami, 4,051,513, Cl. 358-60.000.
Kozak, John: *See—*
Allyn, Jerome B.; Wileman, Richard D.; and Kozak, John, 4,050,502, Cl. 164-68.000.
Kraemer, John F.: *See—*
Holik, Melville J.; and Kraemer, John F., 4,051,092, Cl. 260-29.300.
Kraft, Derald H., to Aspro, Inc. Multi V-grooved pulley structure and method of making same. 4,050,321, Cl. 74-230.800.
Kraftwerk Union Aktiengesellschaft: *See—*
Gemein, Rudolf; and Wotschofsky, Franz, 4,050,845, Cl. 415-172.00A.
Krambeck, Robert Harold; Sequin, Carlo Heinrich; and Walden, Robert Henry, to Bell Telephone Laboratories, Incorporated. Two-dimensional transfer in charge transfer device. 4,051,505, Cl. 357-24.000.
Kramer, Norman C., to Carnation Company. Can orienting device. 4,050,570, Cl. 198-398.000.
Kramer, William E., to Xerox Corporation. Tearable edge strip for plastic sheet. 4,051,285, Cl. 428-43.000.
Krascella, Nicholas Leo, to United Technologies Corporation. Photolytic production of hydrogen. 4,051,005, Cl. 204-157.10R.
Krausz, Francois, to C M Industries. Preparation of benzodiazepine derivatives. 4,051,127, Cl. 260-239.30D.
Krautkramer-Branson, Incorporated: *See—*
Bloch, Peter K., 4,050,292, Cl. 73-67.50R.
Kreckel, Kurt H., to Bausch & Lomb Incorporated. Contact lens disinfecting circuit. 4,051,348, Cl. 219-506.000.
Kreis, Philipp. Braking device for ski scooters. 4,050,705, Cl. 280-11.1BT.
Kresta, Erich; and Gorter, Werner, to Semperit Aktiengesellschaft. Pneumatic tire blanks and process. 4,051,292, Cl. 428-212.000.
Kretschmer, Sylvain: *See—*
Blondet, Bruno; Kretschmer, Sylvain; Lacotte, Jean Pierre; and Peltier, Jean Paul, 4,051,329, Cl. 179-100.30N.
Krimmel, Carl Peter, to G. D. Searle & Co. Piperazinyl cyclobutenones. 4,051,136, Cl. 260-268.00R.
Krippner, Kenneth E., to Artronix, Inc. High speed x-ray pulsing device. 4,051,378, Cl. 250-421.000.
Kronman, Albert F.: *See—*
Peters, Melville F., 4,050,777, Cl. 350-292.000.
Kronstadt, Rachel. Ski carry. 4,050,706, Cl. 280-12.00R.
Kubelka, Axel; and Schweizer, Gottfried, to TMC Corporation. Ski binding. 4,050,716, Cl. 280-614.000.
Kubota, Ltd.: *See—*
Murakami, Shinichi; Akamatsu, Katsutaro; and Hiraishi, Hisashi, 4,050,927, Cl. 75-122.000.
Murakami, Shinichi; Akamatsu, Katsutaro; Morichika, Toshiaki; and Hiraishi, Hisashi, 4,050,929, Cl. 75-171.000.
Kuhlthau, Hans-Peter; and Beecken, Hermann, to Bayer Aktiengesellschaft. Cationic dyestuffs. 4,051,084, Cl. 260-158.000.
Kuhlthau, Hans-Peter; and Beecken, Hermann, to Bayer Aktiengesellschaft. Triazole-azo-phenyl cationic dyestuffs. 4,051,117, Cl. 260-146.00R.
Kuhnert, Hans, to Friedrich Deckel Aktiengesellschaft. Machine tool equipped with a magazine. 4,050,354, Cl. 90-13.00C.
Kulite Semiconductor Products, Inc.: *See—*
Kurtz, Anthony D.; Mallon, Joseph R.; and Brosh, Amnon, 4,051,451, Cl. 338-42.000.
Kume, Masahiro: *See—*
Motoyoshi, Kenya; Kume, Masahiro; and Amano, Yoshinari, 4,050,930, Cl. 75-173.00A.
Kumpf, Sherman S.: *See—*
Smith, James H.; and Kumpf, Sherman S., 4,050,379, Cl. 101-327.000.
Kung, Jo-Fen Tung; and Epstein, Martin Franklin, to General Foods Corporation. Enol ester of α-diketones. 4,051,164, Cl. 260-448.80R.
Kunioka, Kazuo; Mihara, Yutaka; and Noguchi, Takao, to Nippon Kokan Kabushiki Kaisha. Method of quenching large-diameter thin-wall metal pipe. 4,050,963, Cl. 148-128.000.
Kuntz, Irving, to Exxon Research & Engineering Co. Sulfur vulcanizable interpolymers. 4,051,312, Cl. 526-329.000.
Kupsky, George A., to Panel Technology, Inc. Gas discharge display panel with fused sealing plug. 4,051,404, Cl. 313-220.000.
Kuramochi, Shigeaki. Shift mechanism for typewriter. 4,050,567, Cl. 197-72.000.
Kuratsuji, Takatoshi; Inata, Hiroo; and Kawase, Shoji, to Teijin Limited. Polyester granule for melt-shaping and process for the preparation thereof. 4,051,112, Cl. 260-75.00T.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Ishihara, Takao; Sanpei, Kiyoji; Nabatame, Hiroshi; and Motokawa, Shoichi, 4,050,910, Cl. 55-96.000.
Ohtsuka, Shigeto; Ueno, Saburo; Yoshikumi, Chikao; Hirose, Fumio; Ohmura, Yoshio; Wada, Toshihiko; Fujii, Takayoshi; and Takahashi, Eiichi, 4,051,314, Cl. 536-1.000.
Kurihara, Tomomichi: *See—*
Okamoto, Tomiyasu; Nishimoto, Tsunanori; Sawada, Kaoru; Hayakawa, Koji; and Kurihara, Tomomichi, 4,050,609, Cl. 220-9.0LG.
Kurita, Shigeyuki: *See—*
Takemura, Takeshi; Katoh, Yoshihisa; Kurita, Shigeyuki; Sasaki, Susumu; Funabiki, Kyohei; and Hatano, Keizo, 4,051,098, Cl. 260-38.000.
Kuroda, Hideo; and Kanaya, Fumio, to Nippon Telegraph and Telephone Public Corporation. Frame-to-frame coding system. 4,051,530, Cl. 358-136.000.
Kuroda, Noriyasu: *See—*
Katsumata, Takuma; Kato, Koji; Kishigami, Hisao; and Kuroda, Noriyasu, 4,050,642, Cl. 242-55.000.
Kurtz, Anthony D.; Mallon, Joseph R.; and Brosh, Amnon, to Kulite

Semiconductor Products, Inc. Beam type transducers employing dual direction force limiting means. 4,051,451, Cl. 338-42.000.

Kurtz, Bruce E.; and Smalley, Edmund W., to Allied Chemical Corporation. Process for producing ethylene from ethane. 4,051,193, Cl. 260-683.300.

Kushigian, Anthony. Walking beam transfer mechanism with single actuator means to cause both lifting and carrying. 4,050,571, Cl. 198-774.000.

Kusters, Eduard: *See*—
Ahrweiler, Karl-Heinz, 4,050,872, Cl. 425-371.000.

Kutuzov, Jury Prokhorovich: *See*—
Zaikovsky, Vladimir Borisovich; Kutuzov, Jury Prokhorovich; Zakharov, Mikhail Fedorovich; Kavtaev, Evgeny Emelyanovich; Poedinschikov, Jury Grigorievich; Bazhanov, Jury Mikhailovich; and Schapov, Valentin Andrianovich, 4,050,288, Cl. 72-468.000.

Kuwabara, Hideo: *See*—
Yamamoto, Yoshihiko; Shigenobu, Masahiro; and Kuwabara, Hideo, 4,051,045, Cl. 250-536.000.

Kuwana, Noriaki; Hasegawa, Yoshikazu; and Nozu, Yukio, to Eisai Co., Ltd. Process of preparing desacyl-pepsidine with *bacillus pumilus*. 4,050,989, Cl. 195-29.000.

Kwolek, John P.; Urso, William G.; and Jones, Trevor D., to Bendix Corporation, The. Method of welding a friction material to a reinforcing member. 4,050,620, Cl. 228-162.000.

Lacotte, Jean Pierre: *See*—
Blondet, Bruno; Kretschmer, Sylvain; Lacotte, Jean Pierre; and Peltier, Jean Paul, 4,051,329, Cl. 179-100.30N.

LaHaye, Paul G.: *See*—
Craig, Glenn D.; Feuling, David T.; and LaHaye, Paul G., 4,050,877, Cl. 431-76.000.

Laikin, Milton; and Hatchett, George L., to Hydro Products, Inc. Submersible camera. 4,051,523, Cl. 358-99.000.

Laitar, Robert, to CPC International Inc. Furan-phenolic resin coated sand for collapsible foundry molds. 4,051,301, Cl. 428-404.000.

Lamberts, Robert Lewis: *See*—
Drexhage, Karl Heinz; and Lamberts, Robert Lewis, 4,051,374, Cl. 250-370.000.

Lancaster, Patrick R., III; and Lancaster, William G., to Lantech, Inc. Stretch-wrapped package, process and apparatus. 4,050,221, Cl. 53-211.000.

Lancaster, Patrick R., III: *See*—
Lancaster, William G.; and Lancaster, Patrick R., III, 4,050,220, Cl. 53-198.00R.

Lancaster, William G.; and Lancaster, Patrick R., III. Spiral bundler. 4,050,220, Cl. 53-198.00R.

Lancaster, William G.: *See*—
Lancaster, Patrick R., III; and Lancaster, William G., 4,050,221, Cl. 53-211.000.

Landwehrkamp, Hans; Hoeber, W. Gerhard; Goldammer, Georg; and Oexler, Rudolf, to Schubert & Salzer Maschinenfabrik Aktiengesellschaft. Sliver supply apparatus for resolving rollers in open end spinning machines. 4,050,228, Cl. 57-58.950.

Lane, Perry Joe. Trapezoidal lifter. 4,050,672, Cl. 254-10.00R.

Lang, Daniel B.: *See*—
Dimotakis, Paul E.; and Lang, Daniel B., 4,051,433, Cl. 324-78.00R.

Lange, Klaus, to Biax-Werkzeuge K.G. Wezel & Co. Prazisionswerkzeug-Fabrik. Milling cutter. 4,050,128, Cl. 407-59.000.

Langenscheid, Erhard: *See*—
Klemm, Kurt; and Langenscheid, Erhard, 4,051,242, Cl. 424-246.000.

Langhammer, Hans Jurgen, to Klockner-Werke AG. Smelting plant and method. 4,050,683, Cl. 266-164.000.

Langley, Kenneth Richard: *See*—
Needham, Peter Richard; and Langley, Kenneth Richard, 4,050,843, Cl. 415-116.000.

Lantech, Inc.: *See*—
Lancaster, Patrick R., III; and Lancaster, William G., 4,050,221, Cl. 53-211.000.

Large, William R.: *See*—
Collins, George R.; and Large, William R., 4,050,249, Cl. 60-290.000.

LaRos Equipment Company, Inc.: *See*—
Rossio, John H., 4,050,575, Cl. 198-834.000.

Laserplane Corporation: *See*—
Teach, Ted L., 4,050,171, Cl. 37-86.000.

Laskin, Irving; and Van Allen, David, to Polaroid Corporation. Photographic apparatus gear train having a unique set of gears. 4,051,492, Cl. 354-86.000.

Lasky, Harold J. Apparatus and method for supporting and positioning the body to facilitate radiographic mammography procedures. 4,051,380, Cl. 250-451.000.

Lauerer, Uta: *See*—
Wolfle, Rudolf; Rucker, Dieter; and Lauerer, Uta, 4,050,966, Cl. 148-188.000.

Lavrentiev, Konstantin Nikitich; Borisova, Natalya Isaakievna; Vasiliev, Jury Ivanovich; Rodionov, Jury Nikolaevich; Strashinsky, Vadim Konstantinovich; Ioffe, Vladimir Fedorovich; and Vyatskin, Iosif Yakovlevich, deceased (by Vyatskina, Itta Moiseevna, administrator). Programming apparatus for electroerosion cutting machine. 4,051,422, Cl. 318-570.000.

Lawida, Arthur E.: *See*—
Forman, Tracy H.; Herskowitz, Nat H.; and Lawida, Arthur E., 4,050,658, Cl. 248-13.000.

Lawrence, Norman Francis: *See*—
Rose, Larry Edward; and Lawrence, Norman Francis, 4,051,162, Cl. 426-448.000.

Lawrie, Duncan H.; and Vora, Chandrakant Ratilal, to Burroughs Corporation. Multidimensional parallel access computer memory system. 4,051,551, Cl. 364-200.000.

Lawson, Frank; Waverley, Glen; Ward, Denby Harcourt; and Kelly, Robert George, to Broken Hill Associated Smelters Proprietary Limited, The; and Monash University. Continuous sulphur drossing process. 4,050,926, Cl. 75-78.000.

Layotte, Pierre-Claude: *See*—
Cholet, Jacques; and Layotte, Pierre-Claude, 4,050,540, Cl. 181-114.000.

Leach Company: *See*—
Gollnick, Cyril R., 4,050,594, Cl. 214-83.300.

Leach, John Meredith. Sphygmomanometer. 4,050,311, Cl. 73-389.000.

Leach, Paul A., to Jaffrey Fire Protection Company, Inc. Incoming gated relief valve. 4,050,857, Cl. 417-309.000.

Lear Siegler, Inc.: *See*—
Tersch, Richard W.; and Bassoff, Arthur B., 4,050,350, Cl. 90-1.60R.

Learned, Samuel M. Self-propelled and contained trailer washing machine. 4,050,109, Cl. 15-53.00A.

Lebelle, Jean L. Vibrodriver apparatus. 4,050,527, Cl. 173-49.000.

LeBoeuf, Eugene A. Trailer deflector ramp. 4,050,709, Cl. 280-106.00T.

Lech, Richard J.: *See*—
Virtue, Eugene P.; and Lech, Richard J., 4,050,478, Cl. 137-625.660.

Lee, Arnold S. J., to Milstein Medical Research Foundation, Inc. Alarm actuation arrangement for an automatic blood pressure recorder. 4,050,452, Cl. 128-2.05A.

Lee, Hua-Tung, to International Business Machines Corporation. Accordion shift register and its application in the implementation of level sensitive logic system. 4,051,353, Cl. 364-716.000.

Lee, Hwalin: *See*—
Pallos, Ferenc M.; Lee, Hwalin; and Menn, Julius J., 4,051,262, Cl. 424-337.000.

Lee, Jimmy Luther. Electronic fish locator. 4,050,308, Cl. 73-362.0AR.

Lee, John H., to Minnesota Mining and Manufacturing Company. Internally powered traffic control device. 4,050,834, Cl. 404-16.000.

Lee, John N.; and Oswald, Robert B., Jr., to United States of America, Army. Method for controlling low-energy high current density electron beams. 4,051,405, Cl. 313-361.000.

Lee, Yoon C., to Monsanto Company. Interpolymers of a styrenic monomer, a maleic or halomaleic anhydride monomer and a brominated monomer. 4,051,311, Cl. 526-271.000.

Lehman, Roger L.: *See*—
Jutte, Ralph B.; and Lehman, Roger L., 4,051,290, Cl. 428-168.000.

Leigh Products, Inc.: *See*—
Malott, Richard C.; and Trainer, Donald J., 4,050,277, Cl. 72-129.000.

Leimkuhler, Jurgen: *See*—
Kleeberg, Ulrich; Leimkuhler, Jurgen; Knospe, Jurgen; and Stohr, Manfred, 4,050,871, Cl. 425-317.000.

Leir, Charles M.: *See*—
Schuppan, Dietrich; Gerster, John F.; and Leir, Charles M., 4,051,247, Cl. 424-258.000.

Leiser, Manfred; Wegehaupt, Karl-Heinrich; and Marsch, Wilhelm, to Wacker-Chemie GmbH. Adhesive compositions and flexible heating device fabricated therewith. 4,051,454, Cl. 338-328.000.

Lemay, Denis. Underground cable laying machine. 4,050,260, Cl. 61-72.600.

Lemay, Roger E.: *See*—
Welcher, Ray E.; and Lemay, Roger E., 4,050,393, Cl. 112-121.120.

Lemercier, Guy, to Commissariat a l'Energie Atomique. Heat-insulated device, for insulating the top part of the annular space between the main vessel and the safety vessel of a fast-neutron reactor. 4,050,988, Cl. 176-87.000.

Lemmer, Harold G., to General Motors Corporation. Colloidal graphite forging lubricant and method. 4,050,932, Cl. 75-211.000.

Lemper, Anthony L.: *See*—
Pawlak, Joseph A.; Lemper, Anthony L.; and Pattison, Victor A., 4,051,107, Cl. 260-47.00C.

Lenhard, Robert Herman: *See*—
Bernstein, Seymour; Lenhard, Robert Herman; and Conrow, Ransom Brown, 4,051,176, Cl. 260-506.000.

Lenmark, Voigt O. Tank heating and control unit. 4,051,346, Cl. 219-328.000.

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Piller, Bernhard; Lenoir, John; Froehlich, Alfred; Stauner, Thomas; and Tschopp, Paul, 4,051,123, Cl. 260-178.000.

Leonard Storch Enterprises, Inc.: *See*—
Storch, Leonard; and Thomas, George H., 4,051,487, Cl. 354-12.000.

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Buzas, Andre; and Bruneau, Jacques, 4,051,259, Cl. 424-324.000.

Lessin, Charles L. Combination fireplace/furnace. 4,050,440, Cl. 126-120.000.

Lester Construction Co.: *See*—
Miller, Harry, 4,050,588, Cl. 213-75.00B.

Leuven Research & Development VZW: *See*—
Cremers, Adrien Edgard Henri Julien; Maes, Andre Petrus Adolf; and Pleysier, Jozef Leonia, 4,051,026, Cl. 210-38.00B.

Lever Brothers Company: *See*—
Davies, Charles Bloor; and Davies, James Francis, 4,051,054, Cl. 252-89.00R.

LeVitre, Leo A.: *See*—
Park, William; and LeVitre, Leo A., 4,051,322, Cl. 174-65.00R.
Lewis, Roger N., to Argus Chemical Corporation. Alpha halo substituted peroxyesters and their use as polymerization initiators. 4,051,167, Cl. 260-453.0RZ.
Lewis, Roger N.; Pastorino, Ronald L.; and Wilts, James F., to Argus Chemical Corporation. Thermally stable high molecular weight acyl peroxycarbonic esters. 4,051,310, Cl. 526-230.000.
Li, Chi-Tang, to Owens-Illinois, Inc. Glasses, thermally stable high (beta)-cristobalite glass-ceramics and method. 4,050,946, Cl. 106-39.600.
Libby, McNeil & Libby: *See*—
Alleman, Raymond J.; Batina, Raymond T.; and Clark, Ralph J., 4,050,394, Cl. 113-120.00R.
Lichon, James F.; and Cone, Charles Earl. Vehicle identification signal device. 4,051,361, Cl. 362-211.000.
Lichterman, Noah, to Martin Yale Industries, Inc. Punching bag and support means for supporting same in a door frame and the like to prevent twisting or turning of the support means. 4,050,693, Cl. 272-78.000.
Lichtman, Samuel W., to United States of America, Navy. Undersea ranging-communications from altitude via laser. 4,050,819, Cl. 356-51.000.
Liebl, David Edmund. Method of preserving honey. 4,050,952, Cl. 127-46.00R.
Liebold, Hans: *See*—
Grossner, Horst; Liebold, Hans; and Wehnert, Jurgen, 4,050,550, Cl. 188-112.000.
Liermann, Peter: *See*—
Ruhnau, Gerhard; Gudat, Wolfgang; Liermann, Peter; and Hesse, Karl-Heinz, 4,050,747, Cl. 303-95.000.
Lifferth, Henry R. Seal having fluent packing material. 4,050,700, Cl. 277-72.0FM.
Ligda, John P. Protective shield for utility opening in a building framing member. 4,050,205, Cl. 52-357.000.
Lile, Derek L.; and Davis, Neil M., to United States of America, Navy. Method and apparatus for semiconductor profiling using an optical probe. 4,051,437, Cl. 324-158.00R.
Limburg, William W.; Yanus, John F.; and Pai, Damodar M., to Xerox Corporation. Trigonal Se layer overcoated by bis(4-diethylamino-2-methylphenyl)phenylmethane containing polycarbonate. 4,050,935, Cl. 96-1.0PC.
Lin, Chung-Sing. Comb with disposable comb-teeth module. 4,050,469, Cl. 132-11.00R.
Lin, Juei-po, to NCR Corporation. Apparatus and method for increasing the efficiency of random access storage. 4,051,355, Cl. 235-302.300.
Linam, Richard L., to Kelso Marine, Inc. Support with drag arrangement. 4,050,647, Cl. 242-129.800.
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Duca, Mihail; Vasiliu, Dan; Demetrescu, Teodor; Cimpoias, Ion; Linca, Ion; Breazu, Stefan; Antonescu, Virgil; and Cojocaru, Iosif, 4,050,704, Cl. 280-6.00R.
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Tuvesson, Par-Ake; and Johansson, Carl-Gustaf, 4,050,703, Cl. 277-207.00A.
Linde Aktiengesellschaft: *See*—
Ranke, Gerhard, 4,050,909, Cl. 55-68.000.
Lindvay, Michael W., to Velsicol Chemical Corporation. Halogenated isothiuronium salts as flame retardants. 4,051,101, Cl. 260-45.85R.
Linke, Gerda: *See*—
Maas, Dieter; and Linke, Gerda, 4,051,500, Cl. 354-239.000.
Lino, John Louis. Self-sealing holder for containers. 4,050,584, Cl. 211-76.000.
Lipe-Rollway Corporation: *See*—
Armstrong, Jack W., 4,050,572, Cl. 198-347.000.
Liston, Thomas V., to Chevron Research Company. Group II metal mixed salts of two different organic acids in lubricant. 4,051,047, Cl. 252-33.000.
Little, Albert P.: *See*—
Argo, Wesley B.; Edwards, James W.; Little, Albert P.; and Lumb, William M., 4,051,070, Cl. 252-428.000.
Little, Harold A.; and Balsley, Richard L., to General Motors Corporation. Concentric dual engine exhaust system. 4,050,245, Cl. 60-313.000.
Lock, Everett H.: *See*—
Heilhecker, Joe K.; Lock, Everett H.; and Deily, Fred H., 4,051,456, Cl. 340-18.0LD.
Loew, Gunther: *See*—
Jabs, Gert; and Loew, Gunther, 4,051,081, Cl. 260-2.5AD.
Logemann, Willy: *See*—
Ambrogi, Vittorio; Logemann, Willy; Parenti, Marc'Antonio; and Tommasini, Raffaele, 4,051,245, Cl. 424-250.000.
Logue, Clyde Sherman. Baffle for toilet bowl. 4,050,101, Cl. 4-1.000.
Lohr, Delmar Frederick, Jr.; and Kang, Jung Wong, to Firestone Tire & Rubber Company, The. Stabilization of polyfluorophosphazenes with zinc hippurate. 4,051,103, Cl. 260-45.75W.
Londner, Rosette. Method of manufacturing of shoes and shoes thus manufactured. 4,050,108, Cl. 12-142.00E.
Long, David K.; and Miller, Robert W., to National Semiconductor Corporation. Frequency doubling circuit. 4,051,386, Cl. 307-271.000.
Long, Everett James: *See*—
Hines, Clyde Kenneth; Long, Everett James; and Wysocki, Lawrence Eugene, 4,050,762, Cl. 339-108.0TP.
Long, William J., to United States Gypsum Company. Gypsum wallboard. 4,051,291, Cl. 428-201.000.
Longhetto, Francesco, to Semperit Anstalt. Pressure gauge. 4,050,314, Cl. 73-406.000.
Lonnroth, Borje Arne Gunnar. Device for measuring friction between wheel and support. 4,050,290, Cl. 73-9.000.
Lopez, Aaron; and Lopez, Juan, to Raymond Lee Organization, Inc., The, a part interest. Bicentennial eagle clock. 4,050,231, Cl. 58-13.000.
Lopez, Juan: *See*—
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Lorch, Edgar Adolf; and Dwight, David John, to Radiochemical Centre Ltd., The. Ionization detectors. 4,051,376, Cl. 250-381.000.
Lord Corporation: *See*—
Bergman, Lawrence A., 4,050,266, Cl. 64-14.000.
Lorenz, Kurt, to Carl Still, Firma. Method and apparatus for producing form coke. 4,050,990, Cl. 201-5.000.
Lowe Engineering Company: *See*—
Lowe, John G.; and Butler, Roy I., 4,051,024, Cl. 210-30.00A.
Lowe, John G.; and Butler, Roy I., to Lowe Engineering Company. Oil recovery apparatus and method. 4,051,024, Cl. 210-30.00A.
Lucas Industries Limited: *See*—
Thomas, Alan, 4,050,304, Cl. 73-194.00B.
Tokashiki, Kanenobu, 4,050,433, Cl. 123-139.0AQ.
Lucchetti, Renato. Frame particularly for stretching a piece of painting canvas. 4,050,498, Cl. 160-374.100.
Luchsinger, Peter; Muckenheim, Heribert; Riemann, Hanns-Helmut; Sonnenschein, Hans; and Michel, Erich, to Von Roll AG; and Gelsenberg Mannesmann Umweltschutz GmbH. Fluid industrial waste incinerator and its method of operation. 4,050,387, Cl. 110-8.00A.
Luciani, Luciano; and Nava, Gianni, to Montedison S.p.A. Process for purifying polypropylene. 4,051,313, Cl. 528-496.000.
Luedi, Hans R., to Grotnes Machine Works, Inc. Flat base truck rim forming system. 4,050,135, Cl. 29-159.100.
Luey, A. Thomas; and Hite, Frederick S., to Boxboard Research and Development Association. Head box for cylinder molds having a flexible lid element. 4,050,499, Cl. 162-317.000.
Lumb, William M.: *See*—
Argo, Wesley B.; Edwards, James W.; Little, Albert P.; and Lumb, William M., 4,051,070, Cl. 252-428.000.
Lummus Company, The: *See*—
Gelbein, Abraham P.; Janssen, Paul, deceased; and Richtzenhain, Hermann, 4,051,140, Cl. 260-290.00P.
Lundberg, Robert D.; and Makowski, Henry S., to Exxon Research & Engineering Co. Fabrication process for multiphased plastics. 4,051,217, Cl. 264-230.000.
Lundgren, Bengt G. S.; and Ostling, Sture B. G., to SKF Nova AB. Reinforcing material for concrete. 4,050,949, Cl. 106-97.000.
Lundstrom, Boyce H.: *See*—
Ahlgren, Raymond E.; Schwoerer, Danial W.; and Lundstrom, Boyce H., 4,050,947, Cl. 106-52.000.
Lutsenko, Jury Nikolaevich: *See*—
Tagirov, Kurban Magomedovich; Akopian, Nikolai Rubenovich; Konontsev, Valery Vasilievich; and Lutsenko, Jury Nikolaevich, 4,050,529, Cl. 175-422.000.
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Luzzi, John J.: *See*—
Ramey, Chester E.; and Luzzi, John J., 4,051,102, Cl. 260-45.80N.
Ramey, Chester E.; and Luzzi, John J., 4,051,137, Cl. 260-268.0TR.
Spivack, John D.; and Luzzi, John J., 4,051,104, Cl. 260-45.85B.
Lynes, Inc.: *See*—
Coone, Malcolm G.; Malone, Billy C.; and Holbert, Marvin Lee, Jr., 4,050,731, Cl. 294-86.240.
Lyon, James R.: *See*—
Wilkinson, Robert M.; and Lyon, James R., 4,051,277, Cl. 427-288.000.
Lyon, Richard K.: *See*—
Metrailer, William J.; Rebick, Charles; and Lyon, Richard K., 4,051,016, Cl. 208-127.000.
M.A.N. Maybach Mercedes-Benz: *See*—
Kappler, Guenter; and Fehler, Adolf, 4,050,239, Cl. 60-39.51R.
M.I.M. Rolling Consultants (H.K.) Limited: *See*—
Sayer, Raymond Oliver, 4,050,280, Cl. 72-234.000.
Maas, Dieter; and Linke, Gerda, to AGFA-Gevaert Aktiengesellschaft. Photographic camera with a time-delay mechanism. 4,051,500, Cl. 354-239.000.
Mabuchi, Kenichi; and Tsuchimochi, Yoshihisa, to Mabuchi Motor Co., Ltd. Electric sharpener. 4,050,487, Cl. 144-28.500.
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Mabuchi, Kenichi; and Tsuchimochi, Yoshihisa, 4,050,487, Cl. 144-28.500.
MacIsaac, Gerard Connor. Camper assembly. 4,050,732, Cl. 296-23.00A.
Mack, Richard B.; Strom, John A.; and Martinez, Anthony, to United States of America, Air Force. Interference rejection antenna system. 4,051,474, Cl. 343-100.0LE.
MacKay, Kenneth D., to General Mills Chemicals, Inc. Process for the recovery of magnesium. 4,051,223, Cl. 423-157.000.
MacLean, John P.: *See*—
Bunn, Dorrance P., Jr.; Williams, Dale; Jones, Henry B.; and MacLean, John P., 4,051,069, Cl. 252-417.000.
Maeda, Kunio: *See*—
Koseki, Toshinori; Maeda, Kunio; Aboshi, Michihiro; and Kinoshita, Haruo, 4,051,096, Cl. 260-31.80M.
Maeda, Toshiyuki: *See*—
Sakamaki, Hiroshi; and Maeda, Toshiyuki, 4,050,855, Cl. 418-131.000.

Macs, Andre Petrus Adolf: *See*—
Cremers, Adrien Edgard Henri Julien; Maes, Andre Petrus Adolf; and Pleysier, Jozef Leonia, 4,051,026, Cl. 210-38.00B.
Mafune, Yasuo; and Takahashi, Juhei, to Matsushita Electric Industrial Co., Ltd. Speech intercommunication system. 4,051,325, Cl. 179-1.0HF.
Magill, Jacques R., to Crompton & Knowles Corporation. Heat transfer black dyestuff A. 4,050,891, Cl. 8-2.50R.
Magrath, Joseph M. Device and method for feeding fluids to calves and the like. 4,050,460, Cl. 128-223.000.
Mahoney, Fred G.: *See*—
Harpman, Webster B.; and Mahoney, Fred G., 4,050,419, Cl. 123-3.000.
Makoto Takugyo Kabushikikaisha: *See*—
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Makowski, Henry S.: *See*—
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Malbon, Clifford B. Inflated casket. 4,050,125, Cl. 27-2.000.
Mallick, George T., Jr.; and Miller, Robert C., to Westinghouse Electric Corporation. Electronic system for monitoring pneumatic tool performance. 4,051,351, Cl. 364-400.000.
Mallon, Joseph R.: *See*—
Kurtz, Anthony D.; Mallon, Joseph R.; and Brosh, Amnon, 4,051,451, Cl. 338-42.000.
Mallory, George Raeburn, to Mallory Hardware Products Limited. Window cleaning device. 4,050,111, Cl. 15-232.000.
Mallory Hardware Products Limited: *See*—
Mallory, George Raeburn, 4,050,111, Cl. 15-232.000.
Malone, Billy C.: *See*—
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Malott, Richard C.; and Trainer, Donald J., to Leigh Products, Inc. Method and equipment for roll forming products of complex shape. 4,050,277, Cl. 72-129.000.
Manitowoc Company, Inc., The: *See*—
Morrow, James G., Sr.; Pech, David J.; Hunter, Charles A., II; and Porubcansky, Kenneth J., 4,050,586, Cl. 212-59.00R.
Mar-Pha Societe d'Etudes et d'Exploitation de Marques: *See*—
Mattioda, Georges Dominique; and Rocquet, Francois Louis Albert, 4,051,244, Cl. 424-250.000.
Marander, Myron P.: *See*—
Casper, Richard R.; and Marander, Myron P., 4,051,214, Cl. 264-137.000.
Marass, Josef, to Georg Spiess GmbH. Sheet feeding machine. 4,050,692, Cl. 271-267.000.
Marathon Oil Company: *See*—
Hughes, Raymond H.; and Clay, Carl D., 4,050,742, Cl. 302-66.000.
Maravetz, Lester L., to Mobil Oil Corporation. Sulfonamido-and amidophenyl N-methylcarbamates and use as insecticides. 4,051,254, Cl. 424-285.000.
Marceaux, Lionel J., to Raymond Lee Organization, Inc., The, a part interest. Disposable toilet seat cover. 4,050,105, Cl. 4-243.000.
Marconi Co. Ltd., The: *See*—
Weston, Martin, 4,051,516, Cl. 358-11.000.
Margetts, Hugh Grenville, to Girling Limited. Automatic adjusters for hydraulically operated disc brakes. 4,050,548, Cl. 188-71.800.
Marion L. Eakes Co.: *See*—
Eakes, Marion L., 4,050,367, Cl. 98-115.0LH.
Eakes, Marion L., 4,050,368, Cl. 98-115.0LH.
Markfelt, Reinhold S., to UOP Inc. Remotely actuated sampling apparatus. 4,050,315, Cl. 73-425.40R.
Markley, Lowell D., to Dow Chemical Company, The. Substituted benzene-methanol compounds. 4,050,922, Cl. 71-106.000.
Marr, William David: *See*—
Wilson, Alister; Marr, William David; and Guild, George Arthur, 4,051,288, Cl. 428-102.000.
Marriott, Henry J. L.: *See*—
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Mars, Inc.: *See*—
Schwippert, Guustaaf Arthur; and Van Zeggeren, Wilhelm Aart, 4,050,562, Cl. 194-4.00E.
Marsch, Wilhelm: *See*—
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Marsh, Dana G.; and Chu, Joseph Y. C., to Xerox Corporation. Imagewise exposing and heating a microimaging film containing an organo diselenide, a tertiary phosphine or phosphite and an organic peroxide. 4,050,937, Cl. 96-48.00R.
Marsh, Dana G.; and Chu, Joseph Y. C., to Xerox Corporation. Microimaging film containing an organo diselenide, a tertiary phosphine or phosphite and an organic peroxide. 4,050,939, Cl. 96-88.000.
Marsh, Gerald J.: *See*—
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Marshall, Albert H.: *See*—
Swiatosz, Edmund; and Marshall, Albert H., 4,050,166, Cl. 35-25.000.
Martin, Peter G., to Braemar Computer Devices, Inc. Web speed control system. 4,051,415, Cl. 318-7.000.
Martin Processing Co., Inc.: *See*—
Jilla, Dara Ardeshir, 4,050,892, Cl. 8-4.000.
Martin, Samuel W. Magnetic printer and method of performing same. 4,051,484, Cl. 346-74.100.
Martin, Van Clifton: *See*—
Fox, Sidney Jared; Martin, Van Clifton; and Van Hook, Danny Allen, 4,051,538, Cl. 358-296.000.
Martin Yale Industries, Inc.: *See*—
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Martinez, Anthony: *See*—
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Martinez, Carlos J.: *See*—
Tobias, Michael A.; and Martinez, Carlos J., 4,051,089, Cl. 260-22.00R.
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Ishikawa, Noboru; Nakamura, Hidehisa; Maruyama, Kazuyoshi; and Shoji, Akio, 4,051,194, Cl. 260-836.000.
Marvin Glass & Associates: *See*—
Katzman, Allison W.; and Keller, Albert G., 4,050,875, Cl. 425-429.000.
Terzian, Rouben T., 4,050,185, Cl. 46-135.00A.
Masaki, Kenji, to Nissan Motor Co., Limited. Carburetor intake air flow measuring device. 4,050,428, Cl. 123-119.0EC.
Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Heissler, Herbert; Hitsch, Eckart; and Scheer, Wolfgang, 4,050,997, Cl. 204-28.000.
Maschinenfabrik Hennecke GmbH: *See*—
Raffel, Reiner; Ebeling, Wilfried; Nadolski, Klaus; and Schulte, Klaus, 4,050,896, Cl. 23-230.00A.
Masologites, George P., to Atlantic Richfield Company. Process for treating sulfur-containing hydrocarbon feedstocks to produce high yield coke. 4,051,014, Cl. 208-88.000.
Masoneilan International, Inc.: *See*—
Baumann, Hans D., 4,050,479, Cl. 138-42.000.
Borg, Karl S.; and Keith, Gareth A., 4,050,670, Cl. 251-14.000.
Massachusetts Institute of Technology: *See*—
Buckley, Bruce Shawn, 4,050,508, Cl. 165-32.000.
Dewey, C. Forbes, Jr.; and Hocker, Lon O., 4,051,371, Cl. 250-339.000.
Javan, Ali; and Davis, Charles F., Jr., 4,051,462, Cl. 340-173.0LT.
Mastroianni, David Paul: *See*—
Rice, Clifford Brant; and Mastroianni, David Paul, 4,050,625, Cl. 229-38.000.
Mateja, Eugene V.: *See*—
Broderick, Milan A.; and Mateja, Eugene V., 4,050,810, Cl. 355-40.000.
Matison, Gary: *See*—
Wilder, Leslie N.; Whitney, James C.; and Matison, Gary, 4,051,540, Cl. 360-72.000.
MATO Maschinen- und Metallwarenfabrik Curt Matthaei GmbH & Co. KG: *See*—
Stolz, Hermann, 4,050,138, Cl. 29-243.510.
Matsuda, Yasumasa: *See*—
Shimada, Satoshi; Yamada, Kazuji; Matsuda, Yasumasa; Kimura, Ichiro; Shimazoe, Michitaka; and Takahashi, Yukio, 4,050,313, Cl. 73-398.0AR.
Matsushita Electric Company of America: *See*—
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Matsushita Electric Industrial Co., Ltd.: *See*—
Kanai, Kenji, 4,051,542, Cl. 360-113.000.
Mafune, Yasuo; and Takahashi, Juhei, 4,051,325, Cl. 179-1.0HF.
Tanaka, Junzo; and Kai, Toshio, 4,051,341, Cl. 219-10.55D.
Matsuzawa, Hideo: *See*—
Sonobe, Hiroshi; Kato, Masaaki; Matsuzawa, Hideo; Ishii, Hiromichi; and Kobayashi, Masao, 4,051,179, Cl. 260-530.00N.
Mattern, Alfred, to Siemens Aktiengesellschaft. Method for operating a digital time division multiplex communication network. 4,051,328, Cl. 179-15.0AL.
Matthews, Hugh B., to Sperry Rand Corporation. Geothermal energy well casing seal and method of installation. 4,050,517, Cl. 166-315.000.
Matthews, John W.; Sigel, Harry Dennis; and Hauk, Peter, to Newport Research Corporation. Vibration damping apparatus. 4,050,665, Cl. 248-358.00R.
Mattioda, Georges Dominique; and Rocquet, Francois Louis Albert, to Mar-Pha Societe d'Etudes et d'Exploitation de Marques. 2,4-Diamino 5-bromo 6-chloro pyrimidines, process for their preparation and use as pharmaceuticals. 4,051,244, Cl. 424-250.000.
Maus, Julius, to Gretsch-Unitas GmbH Baubeschlagfabrik. Ventilating device. 4,050,364, Cl. 98-37.000.
Maxwell, Lloyd R. Brake testing method. 4,050,299, Cl. 73-126.000.
Mayama, Masayoshi; and Miura, Kiyoyuki, to Konishiroku Photo Industry Co., Ltd. Method of improving adhesive property of plastic supports. 4,051,302, Cl. 428-411.000.
Mayer, Fritz, to Ciba-Geigy AG. Dry thermal transfer of organic compounds by needle-bearing support. 4,050,269, Cl. 68-5.00D.
Mayer, Joseph E., to Kimball of Minnesota, Inc. Adjustable heat recovery system for flue stacks. 4,050,627, Cl. 237-55.000.
Mayer, Karl Heinrich; Petersen, Siegfried; Klauke, Erich; Hoffmeister, Friedrich; and Wuttke, Wolfgang, to Bayer Aktiengesellschaft. 3-Aminoindazole-1 and 2-carboxylic acid derivatives. 4,051,252, Cl. 424-273.00P.
Mayer, Sigmund: *See*—
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Maytum, James N.: *See—*
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Mazzone, Peter A. Lockable obstruction post. 4,050,190, Cl. 49-35.000.
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McCain, William B.; Cosgrove, James F.; and Zagorski, Edward J., to McCain Manufacturing Co. Sheet or signature feeding machine and method. 4,050,686, Cl. 270-54.000.
McCannon, Ralph C.; and Dixon, Jimmie D. Transformer pad. 4,050,659, Cl. 248-19.000.
McCarroll, Alan F.; and Connolly, Douglas P., to Xerox Corporation. Release agent application system for a heated fuser roll. 4,050,801, Cl. 355-3.00R.
McCarroll, Alan F., to Xerox Corporation. Quick release mechanism for a backup roll fuser employed in a copier apparatus. 4,050,803, Cl. 355-3.00R.
McClain, James E.: *See—*
Duesterhoeft, William C.; and McClain, James E., 4,050,765, Cl. 339-117.00R.
McCullough, Wanda: *See—*
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McDonald, Bertrand N., to Babcock & Wilcox Company, The. Heat exchangers. 4,050,511, Cl. 165-162.000.
McDonald, Gerald W. G., to Commonwealth Oil Refining Co. Inc. Hydrocarbon conversion process for removing sulfur and nitrogen with passage of catalyst particles in a series of spaced beds. 4,051,020, Cl. 208-213.000.
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Rogers, George Alvin, 4,050,663, Cl. 248-316.00A.
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Argo, Wesley B.; Edwards, James W.; Little, Albert P.; and Lumb, William M., 4,051,070, Cl. 252-428.000.
Berggren, L. John; Chin, Charles L. D.; and Reilly, Joseph R., 4,050,887, Cl. 432-122.000.
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Lee, Yoon C., 4,051,311, Cl. 526-271.000.
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Hardy, Edgar E.; and David, Donald J., 4,050,895, Cl. 23-230.00R.
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Moore, Alvin Edward. Method for producing light-weight construction member. 4,050,978, Cl. 156-300.000.
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Moore, Earl Phillip, Jr., to Du Pont de Nemours, E. I., and Company. Process for producing an azonitrile with improved color from an aminonitrile in an aqueous system comprising mixed surface active compounds. 4,051,124, Cl. 260-192.000.
Moore, John R., to International Telephone and Telegraph Corporation. Conductive elastomer connector and method of making same. 4,050,756, Cl. 339-59.00M.
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Stratton, Donald W.; and Moorhead, John P., 4,050,832, Cl. 403-321.000.
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Moring, Peter Lothar Ernst, to Dunlop Limited. Belting. 4,050,322, Cl. 74-231.00J.
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Zbikowski, Gerhard; and Geafer, Salahaddin, 4,050,434, Cl. 123-140.0FG.
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Mott, Victor S.: *See*—
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Muller, Hans, to Grapha-Holding AG. Distributing station for printed matter. 4,050,573, Cl. 198-366.000.
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Muller, Walter, to Ruti Machinery Works Ltd. Undulated shed loom with electromagnetic shuttle drive. 4,050,481, Cl. 139-436.000.
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Gilmore, Guy T., 4,050,335, Cl. 82-4.00C.
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Murib, Jawad H., to National Distillers and Chemical Corporation. Oxidation of allyl alcohol to acrylic acid. 4,051,181, Cl. 260-531.00R.
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Pitner, Alfred, 4,050,130, Cl. 29-149.50R.
Nadelson, Jeffrey: *See*—
Anderson, Paul L.; and Nadelson, Jeffrey, 4,051,261, Cl. 424-331.000.
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Raffel, Reiner; Ebeling, Wilfried; Nadolski, Klaus; and Schulte, Klaus, 4,050,896, Cl. 23-230.00A.
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Yanagisawa, Hiroaki; Ando, Akiko; Fukushima, Masami; and Nakao, Hideo, 4,051,320, Cl. 542-420.000.
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Venema, Gerard J., 4,051,065, Cl. 252-359.00A.
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Nash Engineering Company, The: *See*—
Haavik, Harold K., 4,050,851, Cl. 417-68.000.
National Distillers and Chemical Corporation: *See*—
Murib, Jawad H., 4,051,181, Cl. 260-531.00R.
National Gypsum Company: *See*—
Nowick, Chester R.; and DeFranza, Alfred, 4,050,885, Cl. 432-31.000.
National Marine Service, Inc.: *See*—
in't Veld, Cornelis, 4,051,038, Cl. 210-242.00S.
National Research Development Corporation: *See*—
Barlow, Harold Everard Monteagle, 4,051,450, Cl. 333-95.00R.
Hemp, John; and Wyatt, Derek Gerald, 4,050,303, Cl. 73-194.0EM.
Sayce, Leonard Alfred, deceased; and Pettigrew, Robert Martin, 4,051,367, Cl. 250-237.00G.
National Semiconductor Corporation: *See*—
Long, David K.; and Miller, Robert W., 4,051,386, Cl. 307-271.000.
Nava, Gianni: *See*—
Luciani, Luciano; and Nava, Gianni, 4,051,313, Cl. 528-496.000.

NCR Corporation: *See—*
Albertine, Herman, Jr.; Craycraft, Donald G.; and Coleman, William E., 4,051,408, Cl. 315-169.00R.
Craycraft, Donald Gregory, 4,051,409, Cl. 315-169.0TV.
Crump, Leslie L.; and Italiano, Victor J., 4,050,569, Cl. 197-120.000.
Hanny, John Franklin, 4,050,820, Cl. 356-103.000.
Lin, Juei-po, 4,051,355, Cl. 235-302.300.
Michelson, Gunnar P., 4,050,690, Cl. 271-125.000.
Smith, James H.; and Kumpf, Sherman S., 4,050,379, Cl. 101-327.000.
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Needham, Peter Richard; and Langley, Kenneth Richard, to Rolls-Royce (1971) Limited. Gas turbine engines. 4,050,843, Cl. 415-116.000.
Nelson, Larry A.; and Crosby, Philip Stephen, to Tektronix, Inc. Phase locked demodulator. 4,051,440, Cl. 328-134.000.
Nelson, Lorne W., to Honeywell Inc. Filter condition responsive device compensated for changes in medium flow. 4,050,291, Cl. 73-38.000.
Nelson, Norman A.: *See—*
Bundy, Gordon L.; and Nelson, Norman A., 4,051,160, Cl. 260-413.000.
Nelson, Peter H.; and Untch, Karl G., to Syntex (U.S.A.) Inc. 2-Substituted-5-oxo-5H-dibenzo[a,d]cycloheptenes, and derivatives thereof, and methods and compositions for the use thereof. 4,051,260, Cl. 424-331.000.
Nelson, Richard Stuart; Pugh, Stanley Frederick; and Smith, Michael John Stapley, to United Kingdom Atomic Energy Authority. Storage of material. 4,051,063, Cl. 252-301.10W.
Nelson, Robert K.; and Mueller, James F., to Eaton Corporation. Drive axle system useable in 6 × 6 vehicle. 4,050,534, Cl. 180-24.090.
Nelson, Thomas A., to Ford Motor Company. Carburetor automatic choke construction. 4,050,424, Cl. 123-119.00F.
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Neti, Radhakrishna Murty; and Roggenkamp, Ray Lawrence, to Beckman Instruments, Inc. Portable electrochemical cell structure. 4,051,006, Cl. 204-195.00P.
Neuber, Dieter: *See—*
Gorski, Dennis M.; Neuber, Dieter; and Wildmoser, Martin Michael, 4,050,579, Cl. 206-460.000.
Neubert, Rolf; and Wehling, Rolf, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Spinning rotor for open-end spinning unit. 4,050,235, Cl. 57-58.890.
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Kissel, Ernst; Neumann, Eckart; Guenther, Ernst; Valentin, Guenter; and Hoerauf, Werner, 4,051,113, Cl. 260-78.00L.
Neumann Engraving Company: *See—*
Hotton, Joseph G., 4,051,218, Cl. 264-248.000.
Neumark, Gertrude F.: *See—*
Bhargava, Rameshwar Nath; and Neumark, Gertrude F., 4,051,061, Cl. 252-301.4P.
Neuzil, Richard W.; and Korous, Donald J., to UOP Inc. Separation of bi-alkyl substituted monocyclic aromatic isomers. 4,051,192, Cl. 260-674.0SA.
Neville, James J.; Ferrell, Wesley; and Schichman, Daniel, to Uniroyal Inc. Methods of building zero degree belted tires, using high soft stretch belt-forming tapes. 4,050,973, Cl. 156-123.00R.
New, Gordon R. A.; and Curry, William G., to Fram Corporation. Lightweight fan. 4,050,847, Cl. 416-132.00A.
Newcastle Company, Inc.: *See—*
Alduk, Frank P., 4,050,217, Cl. 53-62.000.
Newcomb, C. Lewis, Jr. Vehicle leveler system. 4,050,718, Cl. 280-763.000.
Newell, Carl W. Battery terminal connector. 4,050,773, Cl. 339-224.000.
Newell, Robert Keith, to Pettibone Corporation. Bearing housing adaptable to reworked shaft by reversal method of repair. 4,050,140, Cl. 29-401.00B.
Newman, Neil F., to Exxon Research & Engineering Co. Elastomer blends for tire components. 4,051,083, Cl. 260-5.000.
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Matthews, John W.; Sigel, Harry Dennis; and Hauk, Peter, 4,050,665, Cl. 248-358.00R.
Newton, Albert Eugene: *See—*
Elliott, Richard Montgomery; and Newton, Albert Eugene, 4,050,890, Cl. 432-210.000.
NGK Insulators, Ltd.: *See—*
Hara, Shinichi; and Kato, Taro, 4,050,390, Cl. 110-15.000.
Ito, Isao; and Karita, Yoichi, 4,050,638, Cl. 241-222.000.
Nichols Engineering & Research Corporation: *See—*
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Nielson, Farrel D.: *See—*
Meheen, Homayoun J.; and Nielson, Farrel D., 4,050,254, Cl. 61-39.000.
Niemeier, Gerd: *See—*
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Nihon Denshi Kabushiki Kaisha: *See—*
Imanari, Mamoru; Takeuchi, Makoto; Shimizu, Shozo; and Higuchi, Hisashi, 4,051,429, Cl. 324-.50A.
Nikolov, Ivan Dimov: *See—*
Balevski, Angel Tonchev; Nikolov, Ivan Dimov; Nenov, Dragan Iliev; and Momchilov, Emil Nikolov, 4,050,503, Cl. 164-155.000.
Ninomiya, Yuichi, to Nippon Hoso Kyokai. Charge-coupled amplifier. 4,051,469, Cl. 340-347.0AD.
Nippon Denso Co., Ltd.: *See—*
Yamada, Makoto; Sasaki, Shiro; Kanazawa, Shigenori; and Hayashi, Yoshihiro, 4,050,717, Cl. 280-744.000.
Nippon Electric Company, Ltd.: *See—*
Inukai, Hidemori, 4,051,388, Cl. 307-279.000.
Sato, Susumu; and Tsunemitsu, Hideo, 4,051,508, Cl. 357-71.000.
Uchida, Teiji; and Ueki, Atsufumi, 4,050,782, Cl. 350-96.00C.
Nippon Hoso Kyokai: *See—*
Ninomiya, Yuichi, 4,051,469, Cl. 340-347.0AD.
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Bromfield, Ian Derek; and Seddon, Peter, 4,050,817, Cl. 355-133.000.
Iida, Yozo; Akasaka, Shigeo; and Kawahara, Yasuhito, 4,051,496, Cl. 354-219.000.
Nakagawa, Sadao; Tsukamoto, Masaaki; and Dobashi, Toshio, 4,051,493, Cl. 354-126.000.
Toyoda, Kenji, 4,051,491, Cl. 354-60.00L.
Watanabe, Sataya, 4,050,791, Cl. 350-318.000.
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Kunioka, Kazuo; Mihara, Yutaka; and Noguchi, Takao, 4,050,963, Cl. 148-128.000.
Nakaoka, Kazuhide; Araki, Kenji; Iwase, Koji; Koike, Yasuo; and Fukunaka, Shiro, 4,050,959, Cl. 148-12.300.
Nippon Piston Ring Kabushiki Kaisha: *See—*
Sakamaki, Hiroshi; and Maeda, Toshiyuki, 4,050,855, Cl. 418-131.000.
Nippon Selfoc Company, Limited: *See—*
Kobayashi, Kohroh, 4,050,784, Cl. 350-96.00C.
Nippon Steel Corporation: *See—*
Nakamura, Yasushi; Itou, Michihisa; and Uchimura, Mitsuo, 4,050,960, Cl. 148-16.000.
Nippon Telegraph and Telephone Public Corporation: *See—*
Izumi, Kazuo; and Izumi, Kazuto, 4,051,332, Cl. 179-170.200.
Kuroda, Hideo; and Kanaya, Fumio, 4,051,530, Cl. 358-136.000.
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Nishimura, Matsuo, to Yasui Sangyo Col. Ltd. Two-masted lifting apparatus. 4,050,673, Cl. 254-89.00H.
Nishiyama, Shuji: *See—*
Suzuki, Ikuo; and Nishiyama, Shuji, 4,050,342, Cl. 84-95.00C.
Niskanen, Karl G., to Kennametal Inc. Indexing device. 4,050,355, Cl. 90-56.00R.
Nissan Motor Co., Limited: *See—*
Amagai, Susumu; and Oikawa, Shigeru, 4,050,430, Cl. 123-122.00D.
Masaki, Kenji, 4,050,428, Cl. 123-119.0EC.
Nisshin Kogyo Kabushiki Kaisha: *See—*
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Noel C. Jones & Associates, Inc.: *See—*
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Nogami, Tomoyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Safety device for use in a vehicle brake. 4,050,744, Cl. 303-24.00A.
Noguchi, Masaaki; Tanaka, Yukiyasu; Sekiya, Setsuro; and Motosugi, Katsuhiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Apparatus for supplying rich air/fuel mixture in an internal combustion engine. 4,050,422, Cl. 123-75.00B.
Noguchi, Matsusaburo: *See—*
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Noker, Alvin John: *See—*
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Kanij, Johannes B. W.; Noothout, Arend J.; and Hermans, Marie E. A., 4,051,060, Cl. 252-301.1R.
Nordischer Maschinenbau Rud. Baader: *See—*
Wenzel, Werner, 4,050,118, Cl. 17-54.000.
Norlin Music Company: *See—*
Moog, Robert A., 4,050,343, Cl. 84-1.010.
Normac, Inc.: *See—*
Klein, Max, 4,050,897, Cl. 23-252.00R.
Noro, Tadaomi. Method of interlocking a lateral member and the end of a hollow post and the joint construction used therein. 4,050,828, Cl. 403-201.000.
Norris, James R.: *See—*
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North American Philips Corporation: *See—*
Bhargava, Rameshwar Nath; and Neumark, Gertrude F., 4,051,061, Cl. 252-301.4P.
North State Pyrophyllite Company: *See—*
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Northern Instruments Corporation: *See—*
Miksic, Boris A.; and Stern, Donovan P., 4,051,066, Cl. 252-389.00R.
Northern Telecom Limited: *See—*
Gumb, Beverley William, 4,050,768, Cl. 339-154.00A.
Millette, Louis Guy; Murphy, Peter; and Miller, Georges Michel,

4,051,430, Cl. 324-34.0TK.
Wei, John Shi Sun; and Westwood, William Dickson, 4,050,780, Cl. 350-6.000.
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Nowak, Herbert: *See—*
Schacht, Erich; Mehrhof, Werner; Simane, Zdenek; Kayser, Detlev; and Nowak, Herbert, 4,051,170, Cl. 560-62.000.
Schacht, Erich; Mehrhof, Werner; Simane, Zdenek; and Nowak, Herbert, 4,051,173, Cl. 560-255.000.
Nowick, Chester R.; and DeFranza, Alfred, to National Gypsum Company. Method of drying gypsum wallboard and apparatus therefor. 4,050,885, Cl. 432-31.000.
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Nucledyne Engineering Corporation: *See—*
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Nulph, Robert J.: *See—*
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Nyswander, Reuben E., to United States of America, Navy. Short pulse magnetron transmitter. 4,051,439, Cl. 325-121.000.
O & K Orenstein & Koppel Aktiengesellschaft: *See—*
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O-3 Company: *See—*
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Obana, Sachio: *See—*
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Oberth, Adolf E., to United States of America, Air Force. Catalytic system and polyurethane propellants. 4,050,969, Cl. 149-19.400.
O'Berto, Gerald N.; and Murakami, Gisuke. Three phase a.c. motor drive system. 4,051,418, Cl. 318-227.000.
Odom, Paul R.: *See—*
Takewell, Robert B.; Brandon, Paul W.; and Odom, Paul R., 4,050,869, Cl. 425-222.000.
Oetiker, Hans. Perforating tool. 4,050,154, Cl. 30-363.000.
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Landwehrkamp, Hans; Hoeber, W. Gerhard; Goldammer, Georg; and Oexler, Rudolf, 4,050,228, Cl. 57-58.950.
Ogawa, Hiroshi; and Ariga, Masao, to Canan Kabushiki Kaisha. Device for successive reproduction of information. 4,050,800, Cl. 355-75.000.
Ogawa, Kazuyuki; Hirose, Masahiko; Yada, Masaaki; and Imamura, Hitoshi, to Tokyo Shibaura Electric Co., Ltd. Activated gas reaction apparatus. 4,051,382, Cl. 250-531.000.
Ogura, Katsuyuki: *See—*
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Ohkubo, Noriyoshi; and Kitamura, Nobu, to Furukawa Electric Company Limited, The. Method for producing heat resistant synthetic resin tubes. 4,051,284, Cl. 428-36.000.
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Oikawa, Shigeru: *See—*
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Okamoto, Tomiyasu; Nishimoto, Tsunanori; Sawada, Kaoru; Hayakawa, Koji; and Kurihara, Tomomichi, to Hitachi Shipbuilding & Engineering Co. Heat insulating device for low temperature liquified gas storage tanks. 4,050,609, Cl. 220-9.0LG.
Okamoto, Yasushi: *See—*
Shiga, Shujiro; Katsumata, Takeshi; Okamoto, Yasushi; and Hikasa, Tadashi, 4,051,225, Cl. 423-235.000.
Okamuro, James A., to Borroughs Tool & Equipment Corporation. Piston pin installing and removing apparatus. 4,050,139, Cl. 29-283.000.
Okerblom, Charles Lindberg. Billfold protective device. 4,050,123, Cl. 24-3.00D.
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Okuyama, Sadao: *See—*
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Olin Corporation: *See—*
Dorgnon, Roger, 4,050,344, Cl. 85-68.000.
Ford, James M.; Kircher, Morton S.; and Mosher, Hugh A., 4,051,008, Cl. 204-266.000.
Olsen, Niels Johan, to Bora, S.A., Firma. Laundry feeding apparatus. 4,050,173, Cl. 38-143.000.
Olsen, Richard J., to Goodyear Tire & Rubber Company, The. Removable tread belt. 4,050,495, Cl. 152-187.000.
Olson, John R. Cable and wire cutter. 4,050,152, Cl. 30-90.100.
Omron Tateisi Electronics Co.: *See—*
Fukuyama, Toshifumi; Asakura, Yasunori; and Onji, Norio, 4,051,365, Cl. 250-222.00R.
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Oosterling, Pieter Adriaan; and van Staveren, Hendricus Cornelis, to Multinorm, B.V. Mowing implement. 4,050,224, Cl. 56-295.000.
Opprecht, Paul. Welding head for resistance - welding machine. 4,051,343, Cl. 219-84.000.
Orlens, Alfreds, to Pitney-Bowes, Inc. Label printing apparatus. 4,050,375, Cl. 101-110.000.
Orstein, Jacob L.; and Thomas, Seth R., to Texas Instruments Incorporated. Thermostatic metal. 4,050,906, Cl. 428-617.000.
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Ostrowski, David Stanley: *See—*
Polanyi, Michael Lajos; and Ostrowski, David Stanley, 4,050,450, Cl. 128-2.00L.
Oswald, Alexis A.; and Valint, Paul L., to Ciba-Geigy Corporation. O,S-dialkyl-O-(4-phenylazophenyl)-thiophosphates and pesticidal compositions thereof. 4,051,240, Cl. 424-225.000.
Oswald, Robert B., Jr.: *See—*
Lee, John N.; and Oswald, Robert B., Jr., 4,051,405, Cl. 313-361.000.
Outboard Marine Corporation: *See—*
DuBois, Edmund H., 4,050,831, Cl. 403-243.000.
Owaki, Masanao, to Sony Corporation. Temperature compensating circuit for use with a crystal oscillator. 4,051,446, Cl. 331-116.00R.
Owen, Daniel V.: *See—*
Knoble, David W.; and Owen, Daniel V., 4,051,412, Cl. 315-205.000.
Owens-Corning Fiberglas Corporation: *See—*
Jackson, Robert R., 4,050,639, Cl. 242-18.00G.
Jutte, Ralph B.; and Lehman, Roger L., 4,051,290, Cl. 428-168.000.
Russell, Robert G., 4,050,916, Cl. 65-2.000.
Smith, Roy E., 4,050,608, Cl. 220-9.0LG.
Owens-Illinois, Inc.: *See—*
Li, Chi-Tang, 4,050,946, Cl. 106-39.600.
Tobias, John W.; Taylor, Lynn J.; and Gaumer, Stuart J., 4,051,306, Cl. 526-1.000.
Tom, Elgin Megginson; and Vogelpohl, Roland L., 4,050,602, Cl. 220-2.10A.
Owsley, Dennis C.: *See—*
Bloomfield, Jordan J.; and Owsley, Dennis C., 4,051,076, Cl. 252-522.000.
Oxamine, Inc.: *See—*
Medcalf, Eugene, 4,051,187, Cl. 260-575.000.
Oyama, Shigeaki: *See—*
Shichida, Hiromichi; Katsube, Hideo; Oyama, Shigeaki; Toyoda, Kenichi; and Saito, Mitsuo, 4,050,837, Cl. 408-35.000.
Ozaki, Kiyotaka: *See—*
Hayashi, Kazushige; Minemura, Norihiro; Fujimoto, Iwao; Ozaki, Kiyotaka; Yoshida, Norio; Morishita, Toshio; and Shinoki, Takanori, 4,051,287, Cl. 428-91.000.
Oziomek, James: *See—*
Kang, Jung Wong; and Oziomek, James, 4,051,309, Cl. 526-141.000.
Paap, Hans J.: *See—*
Arnold, Dan M.; Paap, Hans J.; and Scott, Hubert D., 4,051,368, Cl. 250-270.000.
Pace, Carl E. Footwear with detachable symbols. 4,050,168, Cl. 36-136.000.
Pai, Damodar M.: *See—*
Limburg, William W.; Yanus, John F.; and Pai, Damodar M., 4,050,935, Cl. 96-1.0PC.
Painter, Thomas H.: *See—*
Mueller, Edward E.; Painter, Thomas H.; and Harrod, Michael K., 4,050,635, Cl. 241-24.000.
Pakur, Henryk; and Tiemann, Reinhard, to Continental Gummi-Werke Aktiengesellschaft. Belt for belted tires and method of making same. 4,050,497, Cl. 152-361.0FP.
Pall Corporation: *See—*
Pall, David B.; and Roach, Charles J., 4,050,237, Cl. 60-39.080.
Roach, Charles J., 4,050,913, Cl. 55-276.000.
Pall, David B.; and Roach, Charles J., to Pall Corporation. Demister assembly for removing liquids from gases. 4,050,237, Cl. 60-39.080.

Pallos, Ferenc M.; Lee, Hwalin; and Menn, Julius J., to Stauffer Chemical Company. Certain geranyl phenyl ethers and their epoxides and their use in controlling insects. 4,051,262, Cl. 424-337.000.
Palm, Walter C., to Midland-Ross Corporation. Single-housing multi-trumpet air horn. 4,050,405, Cl. 116-142.0FP.
Palmer, Edward Paul: *See—*
Strong, William James; and Palmer, Edward Paul, 4,051,331, Cl. 179-107.00R.
Pan-X Corporation: *See—*
Rigsby, Jesse H., 4,051,327, Cl. 179-5.00R.
Pandrol Limited: *See—*
Miller, David William, 4,050,284, Cl. 72-384.000.
Panel Technology, Inc.: *See—*
Kupsky, George A., 4,051,404, Cl. 313-220.000.
Pannekeet, Wilhelmus; Steenken, Gerhard E. W. K.; and Voogd, Roeland H., to Akzona Incorporated. Process for the separate recovery of vanadium and molybdenum. 4,051,221, Cl. 423-54.00.
Papadatos, George. Mechanism for securing a door in open or closed position. 4,050,723, Cl. 292-164.000.
Parent, Guy, to Societe Anonyme dite: Compagnie Industrielle des Telecommunications Cit-Alcatel. Position measuring device. 4,051,350, Cl. 364-432.000.
Parenti, Marc'Antonio: *See—*
Ambrogi, Vittorio; Logemann, Willy; Parenti, Marc'Antonio; and Tommasini, Raffaele, 4,051,245, Cl. 424-250.000.
Park, William; and LeVitre, Leo A. Electrical junction box. 4,051,322, Cl. 174-65.00R.
Parker, Delmer G., to Xerox Corporation. Magnetic brush crossmixing system. 4,050,413, Cl. 118-647.000.
Parker-Hannifin Corporation: *See—*
Gasier, James Mills; and Currie, William Edgar, 4,050,286, Cl. 72-416.000.
Parks, Bernette Frederick: *See—*
Parks, Blanchard St. Clair; and Parks, Bernette Frederick, 4,050,257, Cl. 61-48.000.
Parks, Blanchard St. Clair; and Parks, Bernette Frederick. Demountable dock assembly. 4,050,257, Cl. 61-48.000.
Parma, John N. Tool for truck operators. 4,050,107, Cl. 7-1.00E.
Pasquier, Armand Rene, to Etudes Techniques et Realisations (E.T.R.). Snow distribution system. 4,050,169, Cl. 37-1.000.
Pastorino, Ronald L.: *See—*
Lewis, Roger N.; Pastorino, Ronald L.; and Wilts, James F., 4,051,310, Cl. 526-230.000.
Patamaa, Esko. Casting machine for casting concrete elements. 4,050,868, Cl. 425-135.000.
Pattison, Victor A.: *See—*
Pawlak, Joseph A.; Lemper, Anthony L.; and Pattison, Victor A., 4,051,107, Cl. 260-47.00C.
Patzschke, Hans-Peter, to Dr. Kurt Herberts & Co. Gesellschaft mit Beschrankter Haftung Vorm. Otto Louis Herberts. Modified water-dilutable polymer oil imides containing carboxyl groups. 4,051,198, Cl. 260-879.000.
Paulin, Robert Charles; and Billings, Ronald Joseph, to Chemetron Corporation. Double-sigmoid connector. 4,050,830, Cl. 403-205.000.
Pawlak, Joseph A.; Lemper, Anthony L.; and Pattison, Victor A., to Hooker Chemicals & Plastics Corporation. Microstructured high molecular weight-low viscosity polyester polymers. 4,051,107, Cl. 260-47.00C.
Pazos, Jose Francisco, to Du Pont de Nemours, E. I., and Company. High resolution photohardenable coating compositions containing tetracyanoethane compounds. 4,050,941, Cl. 96-115.00P.
Pearson, Eugene Walford, to Canron, Inc. Power knife adjustment for a shear machine. 4,050,338, Cl. 83-641.000.
Pech, David J.: *See—*
Morrow, James G., Sr.; Pech, David J.; Hunter, Charles A., II; and Porubcansky, Kenneth J., 4,050,586, Cl. 212-59.00R.
Pechmeze, Jacques Pierre Edmond: *See—*
Dupre, Victor Marie; Pechmeze, Jacques Pierre Edmond; and Sureau, Robert Frederic Michel, 4,051,145, Cl. 548-372.000.
Peck, John F.; and Hodges, Carl N., to University Patents, Inc. Solar energy device and system. 4,050,443, Cl. 126-270.000.
Pedersen, Rolf: *See—*
Van Sluis, Jan Adolf; Reinhart, Frans Remko; Johansen, Johan Peter; and Pedersen, Rolf, 4,050,467, Cl. 131-147.00A.
Pehl, Willis G.: *See—*
Barker, Frank S., deceased; and Pehl, Willis G., 4,050,209, Cl. 52-478.000.
Peltier, Jean Paul: *See—*
Blondet, Bruno; Kretschmer, Sylvain; Lacotte, Jean Pierre; and Peltier, Jean Paul, 4,051,329, Cl. 179-100.30N.
Pennsylvania Engineering Corporation: *See—*
Baum, Joerg Peter, 4,050,682, Cl. 266-158.000.
Pereyra, Armand J. Rain-responsive control. 4,050,853, Cl. 417-44.000.
Perisse, Pierre. Automatic surgical apparatus for ligutaring blood vessels. 4,050,465, Cl. 128-326.000.
Perri, Joseph. Ingot mold with heat reflecting cover. 4,050,668, Cl. 249-106.000.
Peteri, Dezso: *See—*
Scherm, Arthur; and Peteri, Dezso, 4,051,143, Cl. 260-295.50R.
Peters, Margot Elizabeth: *See—*
Peters, Melville F., 4,050,777, Cl. 350-292.000.
Peters, Melville F., to Peters, Walter Todd; Peters, Margot Elizabeth; and Kronman, Albert F. Solar energy reflecting apparatus with yieldably biased reflectors. 4,050,777, Cl. 350-292.000.
Peters, Walter Todd: *See—*
Peters, Melville F., 4,050,777, Cl. 350-292.000.
Petersen, Gerald A. Excavator tooth, holder therefor and staple retainer. 4,050,172, Cl. 37-142.00A.
Petersen, Henning Borge: *See—*
Borrevang, Poul; and Petersen, Henning Borge, 4,051,133, Cl. 544-18.000.
Petersen, Siegfried: *See—*
Mayer, Karl Heinrich; Petersen, Siegfried; Klauke, Erich; Hoffmeister, Friedrich; and Wuttke, Wolfgang, 4,051,252, Cl. 424-273.00P.
Peterson, Donald J., to Procter & Gamble Company, The. Protective coatings. 4,051,279, Cl. 427-355.000.
Peterson, Francis C., to C. Hager & Sons Hinge Manufacturing Company. Device for operating a pocket door. 4,050,189, Cl. 49-26.000.
Peterson Manufacturing Company: *See—*
Slater, Charles A., Jr.; and Darby, Spencer, 4,051,360, Cl. 362-363.000.
Peterson, Paul F., to United States of America, Air Force. Ejector rack. 4,050,656, Cl. 244-137.00R.
Petrolite Corporation: *See—*
Quinlan, Patrick M., 4,051,110, Cl. 260-72.00R.
Redmore, Derek; and Woodson, Alfred E., 4,051,029, Cl. 210-58.000.
Petrulacci-Stephanopoli, Georges: *See—*
Amaudric du Chaffaut, Patrick; and Petrulacci-Stephanopoli, Georges, 4,050,416, Cl. 119-97.00R.
Pettibone Corporation: *See—*
Newell, Robert Keith, 4,050,140, Cl. 29-401.00B.
Pettigrew, Robert Martin: *See—*
Sayce, Leonard Alfred, deceased; and Pettigrew, Robert Martin, 4,051,367, Cl. 250-237.00G.
Pettingell, James R.; and Armstrong, Lee R., to United Technologies Corporation. Measuring electrical parameters of an internal combustion engine during cranking. 4,050,297, Cl. 73-117.200.
Pfeiffer, Kurt; Dietrich, Johannes; Beckmann, Gunter; and Herkt, Karl-Heinz, to Chemische Werke Huls Aktiengesellschaft. Cooling unit for large polymerization vessels. 4,050,901, Cl. 23-285.000.
Pfiffner, Albert: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 4,051,319, Cl. 542-413.000.
Pfister, Lewis; and Ehas, Edward, to Flynn Burner Corporation. Conveyor system for passing coated cans through chamber. 4,050,888, Cl. 432-124.000.
Pfizenmaier, Wolfgang, to Heidelberger Druckmaschinen Aktiengesellschaft. Ink fountain for printing machine. 4,050,380, Cl. 101-365.000.
Pfliegel, Todor: *See—*
Guczoghy, Lajos; Pfliegel, Todor; Puklics, Maria; Institoris, Laszlo; and Seres, Jeno, 4,051,156, Cl. 260-393.000.
Pforzheimer Uhren-Rohwerke Rudolf Wehner: *See—*
Ingenieur, Kurt Murrle, 4,050,233, Cl. 58-58.000.
Pfotenhauer, James M. Spring type projecting device. 4,050,438, Cl. 124-20.00R.
Phillips, Marie B.: *See—*
Harris, Don Navarro; Phillips, Marie B.; and Goldenberg, Harold Jacob, 4,051,236, Cl. 424-101.000.
Phillips Petroleum Company: *See—*
Fodor, Lawrence M., 4,051,197, Cl. 260-876.00B.
Scoggins, Lacey E.; and Campbell, Robert W., 4,051,087, Cl. 260-18.00N.
Small, William M., 4,050,506, Cl. 165-1.000.
Udipi, Kishore; and Hsieh, Henry L., 4,051,199, Cl. 260-880.00R.
Vanderveen, John W., 4,051,135, Cl. 23-259.500.
Phillips, Reginald Andrew; and Darbyshire, Kenneth, to Gullick Dobson Limited. Mine roof support control systems. 4,050,256, Cl. 61-45.00D.
Phone-Ducs, Inc.: *See—*
Streit, Kenneth F., 4,050,721, Cl. 285-93.000.
Piccolo, Luigi; Calcagno, Benedetto; and Bossi, Emilio, to Societa' Italiana Resine S.I.R. S.p.A. Process for the post-treatment of titanium dioxide pigments. 4,050,951, Cl. 106-300.000.
Picker Corporation: *See—*
Hatch, Kenneth F., 4,051,373, Cl. 250-363.00S.
Pickering, David Harrison. Bracket. 4,050,662, Cl. 248-291.000.
Pickett, Robert B.; and Baghdady, Elie J., to International Telephone and Telegraph Corporation. Co-channel multiple signal broadcasting system. 4,051,438, Cl. 325-45.000.
Pigney, James Malcolm: *See—*
Hope, Frederick John Charles; and Pigney, James Malcolm, 4,050,298, Cl. 73-121.000.
Pilgram, Kurt H. G., to Shell Oil Company. Herbicidal semicarbazides. 4,050,918, Cl. 71-86.000.
Piller, Bernhard; Lenoir, John; Froehlich, Alfred; Stauner, Thomas; and Tschopp, Paul, to Ciba-Geigy AG. Sulfonic-acid-group containing disazo dyestuffs. 4,051,123, Cl. 260-178.000.
Piovanelli Macchinari e Impianti S.p.A.: *See—*
Boccoli, Temistocle, 4,051,080, Cl. 260-2.300.
Pitner, Alfred, to Nadella, a part interest. Method for mounting a bearing in a universal joint. 4,050,130, Cl. 29-149.50R.
Pitney-Bowes, Inc.: *See—*
Check, Frank T., Jr., 4,050,374, Cl. 101-91.000.
Orlens, Alfreds, 4,050,375, Cl. 101-110.000.
Storace, Anthony, 4,050,530, Cl. 177-1.000.
Pitocchi, Omero, to Raymond Lee Organization, Inc., The. Can opener gun. 4,050,155, Cl. 30-400.000.
Pitt, Harold M., to Stauffer Chemical Company. Process for the manufacture of α-chloropropionyl chloride. 4,051,182, Cl. 260-544.00Y.
Plant, Howard L.; Zukel, John W.; and Ames, Ronald B., to Uniroyal

Inc. Regulation of the natural growth or development of plants with 2-sulfinyl or 2-sulfonyl pyridine N-oxide compounds. 4,050,921, Cl. 71-94.000.

Plastic Injectors, Inc.: *See*—
Burchette, Robert L., Jr.; and Harris, Edward J., 4,050,645, Cl. 242-125.100.

Pleysier, Jozef Leonia: *See*—
Cremers, Adrien Edgard Henri Julien; Maes, Andre Petrus Adolf; and Pleysier, Jozef Leonia, 4,051,026, Cl. 210-38.00B.

Plumlee, Karl W.; and Vernon, Lonnie W., to Exxon Research & Engineering Co. Coal liquefaction process. 4,051,012, Cl. 208-8.000.

Plymate, Robert R. Method of preparing bovine colostrum for use in treating livestock. 4,051,235, Cl. 424-85.000.

Podvin, Richard T.: *See*—
Verkins, Wayne R.; Podvin, Richard T.; and Rist, Karl Frederick, III, 4,050,971, Cl. 156-69.000.

Poedinschikov, Jury Grigorievich: *See*—
Zaikovsky, Vladimir Borisovich; Kutuzov, Jury Prokhorovich; Zakharov, Mikhail Fedorovich; Kavtaev, Evgeny Emelyanovich; Poedinschikov, Jury Grigorievich; Bazhanov, Jury Mikhailovich; and Schapov, Valentin Andrianovich, 4,050,288, Cl. 72-468.000.

Poetsch, Dieter, to Robert Bosch G.m.b.H. System for automatic color balance correction. 4,051,511, Cl. 358-29.000.

Pohl, Gerhard: *See*—
Knorre, Helmut; Fischer, Joachim; and Pohl, Gerhard, 4,051,228, Cl. 423-268.000.

Pohlke, Rolf: *See*—
Seubert, Jurgen; Pohlke, Rolf; Thomas, Herbert; and Andrews, Peter, 4,051,243, Cl. 424-250.000.

Poland, Robert L., to Chromalloy American Corporation. Folding wing disc harrow. 4,050,523, Cl. 172-311.000.

Polanyi, Michael Lajos; and Ostrowski, David Stanley, to American Optical Corporation. Reflection standard for fiber optic probe. 4,050,450, Cl. 128-2.00L.

Polaroid Corporation: *See*—
Laskin, Irving; and Van Allen, David, 4,051,492, Cl. 354-86.000.

Pollinger, Hans; and Scheffel, Bernd, to Knorr-Bremse GmbH. Automatic brake resetting device. 4,050,553, Cl. 188-203.000.

Polygulf Associates: *See*—
Horowitz, Carl; Dichter, Michael; and Shah, Navinchandra Bhogilal, 4,051,090, Cl. 260-23.70M.

Polysius AG: *See*—
Goldmann, Wolf; Schepers, Georg; Heinemann, Otto; Schmits, Heinz-Herbert; and Ritzmann, Horst, 4,050,883, Cl. 432-14.000.

Pompei, Arturo; and Winters, Alden Bernard, to Boeing Company, The. Aircraft interior ceiling panel assembly and attachment apparatus. 4,050,208, Cl. 52-460.000.

Ponczak, Samuel: *See*—
Rosnowski, Wojciech; and Ponczak, Samuel, 4,050,967, Cl. 148-189.000.

Pontier, Andre J. A.: *See*—
Duclaux, Daniel; Pontier, Andre J. A.; and Ferret, Georges Paul, 4,051,224, Cl. 423-210.000.

Portable Laboratories, Inc.: *See*—
Dykstra, Donald P., 4,050,752, Cl. 312-243.000.

Porubcansky, Kenneth J.: *See*—
Morrow, James G., Sr.; Pech, David J.; Hunter, Charles A., II; and Porubcansky, Kenneth J., 4,050,586, Cl. 212-59.00R.

Possell, Clarence R.; and Winkler, Robert J. Energy saving garbage disposal unit. 4,050,636, Cl. 241-46.00B.

Post Office, The: *See*—
Greenaway, Philip Ernest; and Rollett, John Mortimer, 4,051,385, Cl. 307-233.00R.

Potomac Applied Mechanics, Inc.: *See*—
Stubbings, James H., 4,050,336, Cl. 83-486.100.
Stubbings, James Henry, 4,051,342, Cl. 219-60.00A.

Potter, James Charles: *See*—
Hollett, Reginald; and Potter, James Charles, 4,050,437, Cl. 123-139.0AC.

Power, John M., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Electrically detonated explosive device. 4,050,382, Cl. 102-16.000.

Powers, Harold C.; and Cambron, Robert B., to Caterpillar Tractor Co. Oil damped piston. 4,050,360, Cl. 92-127.000.

Pramstraller, Wilmuth, to Durst AG. Fabrik Fototechnischer Apparate Bozen. Lamp-adjusting mechanism, particularly for photographic enlarging apparatus. 4,050,813, Cl. 355-67.000.

Pramstraller, Wilmuth, to Durst S.p.A. Fabbrica Macchine ed Apparecchi Fototecnici. Photographic enlarging apparatus with hinged image holder. 4,050,815, Cl. 355-75.000.

Pravda, Milton F.: *See*—
Bienert, Walter B.; and Pravda, Milton F., 4,050,509, Cl. 165-45.000.

Prenn, Otto E., to Steel Company of Canada, Limited, The. Paraffin sucker rod scraper and rod centralizer. 4,050,514, Cl. 166-176.000.

Prescott, John Fraser; and Sanford, Emerson Cecil, to Atomic Energy of Canada Ltd. Process for the reclamation of alkali metal alkylamides. 4,051,185, Cl. 260-561.00R.

Prickett, Robert J.: *See*—
Archer, Donald H.; McOwen, Sherwood A., Jr.; and Prickett, Robert J., 4,051,476, Cl. 343-700.0MS.

Priegel, Jack C., to Autotronic Controls Corporation. Electronic carburetion system for low exhaust emissions of internal combustion engines. 4,050,878, Cl. 431-90.000.

Prince, Anthony; Halpern, Otto; and Ackrell, Jack, to Syntex (U.S.A.) Inc. 6,11-Dihydrodibenzo-[b.e.]-thiepin-11-one-3-carboxaldehyde. 4,051,148, Cl. 260-327.00B.

Princeton Electronic Products, Inc.: *See*—
Waxman, Albert S., 4,051,406, Cl. 313-391.000.

Pristash, David J. Power drive system. 4,050,536, Cl. 180-66.00B.

Privee, James A., to United States of America, Navy. Digital amp-hour monitor. 4,051,424, Cl. 320-48.000.

Procter & Gamble Company, The: *See*—
Diehl, Francis Louvaine; and Edwards, James Byrd, 4,051,046, Cl. 252-8.600.
Gieske, Henry Anthony; and Juneja, Prem Sagar, 4,051,234, Cl. 424-52.000.
Hartman, William Law, 4,051,056, Cl. 252-99.000.
Peterson, Donald J., 4,051,279, Cl. 427-355.000.
Shires, Philip John; and Kennedy, Timothy James, 4,051,268, Cl. 426-548.000.
Trinh, Toan; and Yeazell, Bruce Albert, 4,051,055, Cl. 252-95.000.

Produits Chimiques Ugine Kuhlmann: *See*—
Dupre, Victor Marie; Pechmeze, Jacques Pierre Edmond; and Sureau, Robert Frederic Michel, 4,051,145, Cl. 548-372.000.

Proehl, Norman P., to Proehl, Norman P. Dredge cutter head. 4,050,170, Cl. 37-67.000.

Proskow, Stephen, to Du Pont de Nemours, E. I., and Company. Ultraviolet screening agents and coating materials containing organosilane ester groups. 4,051,161, Cl. 260-448.80R.

Protze, Karl-Heinz, to Eltra KG Leicht & Trambauer. Arrangement for detecting the presence of snow, ice and other freezing precipitation, particularly on railway track structures, and the like. 4,051,466, Cl. 340-234.000.

Protzman, Walter P.; and Evans, George L., to Schering Corporation. Serologic test for systemic candidiasis. 4,051,232, Cl. 424-12.000.

Provi, Mike A.; and Guinter, S. Robert, to Brearley Company, The. Platform type weighing scale. 4,050,532, Cl. 177-211.000.

Pugh, Stanley Frederick: *See*—
Nelson, Richard Stuart; Pugh, Stanley Frederick; and Smith, Michael John Stapley, 4,051,063, Cl. 252-301.10W.

Puklics, Maria: *See*—
Guczoghy, Lajos; Pfliegel, Todor; Puklics, Maria; Institoris, Laszlo; and Seres, Jeno, 4,051,156, Cl. 260-393.000.

Pulak, Richard P., to UOP Inc. Spent catalyst regeneration with internal and external regenerated-catalyst recycle means. 4,050,902, Cl. 23-288.00B.

Purdue Research Foundation: *See*—
Geddes, Leslie A.; and Bourland, Joe D., 4,051,539, Cl. 360-44.000.

Puritan-Bennett Corporation: *See*—
Friend, Jack M., 4,050,458, Cl. 128-145.800.

Purviance, John R. Game and game apparatus. 4,050,697, Cl. 273-139.000.

QSI Systems, Inc.: *See*—
Baxter, Larry K., 4,051,524, Cl. 358-108.000.

Quatrochi, Philip J.: *See*—
Adelman, Stanley M.; Ellington, Donal G.; and Quatrochi, Philip J., 4,050,347, Cl. 86-20.00R.

Query, Grady W.; and Query, O. Grady. Fluid dispersion method and apparatus. 4,050,629, Cl. 239-11.000.

Query, O. Grady: *See*—
Query, Grady W.; and Query, O. Grady, 4,050,629, Cl. 239-11.000.

Quinlan, Patrick M., to Petrolite Corporation. Methylene phosphonates of polymerized polyalkylenepolyamines. 4,051,110, Cl. 260-72.00R.

R.C.M. Corporation: *See*—
Johnson, Arthur F., 4,050,925, Cl. 75-30.000.
Johnson, Arthur F., 4,050,999, Cl. 204-67.000.

Radiochemical Centre Ltd., The: *See*—
Lorch, Edgar Adolf; and Dwight, David John, 4,051,376, Cl. 250-381.000.

Radloff, Marvin D.: *See*—
Gross, Roger A.; Radloff, Marvin D.; and Gault, Donald D., 4,050,799, Cl. 353-74.000.

Raffel, Reiner; Ebeling, Wilfried; Nadolski, Klaus; and Schulte, Klaus, to Maschinenfabrik Hennecke GmbH; and Bayer Aktiengesellschaft. Method and apparatus for the production of reaction mixtures from liquid reaction components. 4,050,896, Cl. 23-230.00A.

Raichle, Karl: *See*—
Hess, Bernhard; and Raichle, Karl, 4,051,085, Cl. 260-16.000.

Raine, Thomas: *See*—
Bodem, Johann; and Raine, Thomas, 4,050,127, Cl. 407-107.000.

Rajchman, Jan Aleksander, to RCA Corporation. Apparatus and method for modulating a flat panel display device. 4,051,468, Cl. 340-324.00M.

Ralph B. Carter Company: *See*—
Boschen, William O.; Annichiarico, Angelo V.; and Johnson, Arthur L., 4,051,035, Cl. 210-220.000.

Ralph M. Parsons Company, The: *See*—
McNamee, Gerald P.; Roszkowski, Theodore R.; Stanbridge, David W.; and White, Gerald A., 4,050,908, Cl. 48-210.000.

Ralston, Harold A.; and Christensen, Alton B., to J. I. Case Company. Multi-section harrow assembly. 4,050,522, Cl. 172-311.000.

Rame-Hart, Inc.: *See*—
Grat, Felix R., 4,050,822, Cl. 356-171.000.

Ramey, Chester E.; and Luzzi, John J., to Ciba-Geigy Corporation. Bicyclic hindered amino acids, metal salts thereof and stabilized compositions. 4,051,102, Cl. 260-45.80N.

Ramey, Chester E.; and Luzzi, John J., to Ciba-Geigy Corporation. Substituted piperazine diones and polymeric compositions stabilized thereby. 4,051,137, Cl. 260-268.0TR.

Rand, Royden N.: *See*—
Goffe, Charles A., deceased; Rand, Royden N.; and Wu, Tai W., 4,050,898, Cl. 23-253.0TP.
Ranke, Gerhard, to Linde Aktiengesellschaft. Process and apparatus for the production of hydrogen and carbon dioxide. 4,050,909, Cl. 55-68.000.
Rapoza, Edward J., to Becton, Dickinson and Company. Pipette aspirator device. 4,050,316, Cl. 73-425.600.
Raue, Roderich: *See*—
Friedrich, Adolf; Harnisch, Horst; and Raue, Roderich, 4,051,134, Cl. 544-217.000.
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Rausch, David J.: *See*—
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Ray, Ranjan: *See*—
Tanner, Lee Elliot; Ray, Ranjan; and Cline, Carl F., 4,050,931, Cl. 75-175.500.
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Smith-Johannsen, Robert; and Moyer, Wendell W., Jr., 4,051,075, Cl. 252-511.000.
Rayfield, Wilson Parker: *See*—
Biggs, Donald William; and Rayfield, Wilson Parker, 4,050,617, Cl. 226-1.000.
Raymond Lee Organization, Inc., The: *See*—
Asper, William, 4,050,176, Cl. 43-1.000.
Brown, Albert, 4,050,698, Cl. 273-152.410.
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DeToia, Vincent D., 4,050,652, Cl. 244-23.00C.
Hubbs, Robert J., 4,050,174, Cl. 42-59.000.
Lopez, Aaron; and Lopez, Juan, 4,050,231, Cl. 58-13.000.
Marceaux, Lionel J., 4,050,105, Cl. 4-243.000.
Pitocchi, Omero, 4,050,155, Cl. 30-400.000.
Samardzija, Momcilo M.; and Samardzija, Cheryl, 4,050,708, Cl. 280-47.260.
Smith, Lennie R., 4,050,455, Cl. 128-80.00F.
Raytheon Company: *See*—
Archer, Donald H.; McOwen, Sherwood A., Jr.; and Prickett, Robert J., 4,051,476, Cl. 343-700.0MS.
Rosvold, Warren C., 4,051,507, Cl. 357-60.000.
Razdan, Raj Kumar; Dalzell, Haldean Cloyce; and Herlihy, Patricia, to Sharps Associates. Oxo C-ring benzopyrans. 4,051,152, Cl. 260-345.300.
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Greaves, Melvin J.; and Razgaitis, Frank V., 4,050,592, Cl. 214-18.200.
RCA Corporation: *See*—
Ahmed, Adel Abdel Aziz, 4,051,391, Cl. 307-297.000.
Cochran, Larry Allen, 4,051,510, Cl. 358-28.000.
Harwood, Leopold Albert, 4,051,519, Cl. 358-21.000.
Harwood, Leopold Albert, 4,051,521, Cl. 358-30.000.
Heckman, LeRoy Francis, Jr., 4,051,447, Cl. 333-24.00R.
Rajchman, Jan Aleksander, 4,051,468, Cl. 340-324.00M.
Rosenthal, Bruce David; and Dingwall, Andrew Gordon Francis, 4,051,392, Cl. 307-297.000.
Rosnowski, Wojciech; and Ponczak, Samuel, 4,050,967, Cl. 148-189.000.
Sendelweck, Gene Karl, 4,051,518, Cl. 358-20.000.
Wheatley, Carl Franklin, Jr., 4,051,441, Cl. 330-288.000.
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Kanij, Johannes B. W.; Noothout, Arend J.; and Hermans, Marie E. A., 4,051,060, Cl. 252-301.1R.
Rebick, Charles: *See*—
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Rebadat, Siegfried; Mayer, Sigmund; and Alfranseder, Josef, to Hoechst Aktiengesellschaft. Process for reactivating silver catalysts used in the manufacture of ethylene oxide by direct oxidation. 4,051,068, Cl. 252-412.000.
Redmore, Derek; and Woodson, Alfred E., to Petrolite Corporation. Process of inhibiting scale formation with mixtures of thio-, oxygen or thio-oxygen phosphates and pyrophosphates. 4,051,029, Cl. 210-58.000.
Reeves, Charlie F., to United States of America, Navy. Parallel/time-shared variable time delay generator with common timing control and fast recovery. 4,051,390, Cl. 307-293.000.
Reggia, Frank; and Jones, Howard S., Jr., to United States of America, Army. Conformal edge-slot radiators. 4,051,480, Cl. 343-705.000.
Reibetanz, Wilbert; Wanner, Karl; and Hahner, Reinhard, to Robert Bosch G.m.b.H. Self drilling anchoring dowel. 4,050,345, Cl. 85-68.000.
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Reid, Albert Richard, to Hercules Incorporated. Absorption rate of absorbent polymers by treating with glyoxal. 4,051,086, Cl. 260-17.4GC.
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Reinhart, Frans Remko: *See*—
Van Sluis, Jan Adolf; Reinhart, Frans Remko; Johansen, Johan Peter; and Pedersen, Rolf, 4,050,467, Cl. 131-147.00A.
Reinink, Jan: *See*—
de Boer, Jan; and Reinink, Jan, 4,050,151, Cl. 30-34.100.
Reiters, Ludvigs O., to Bofors America, Inc. Strain gage application. 4,050,976, Cl. 156-233.000.
Remington, Richard W., to Electron Emission Systems. Low-temperature thermionic emitter. 4,051,272, Cl. 427-54.000.
Reneau, Bobby J. Hot tap for pipeline. 4,050,720, Cl. 285-18.000.
Reni-Cirillo S.r.l.: *See*—
Reni, Mario, 4,050,406, Cl. 118-19.000.
Reni, Mario, to Reni-Cirillo S.r.l. Coating machine for confectionery, pharmaceuticals and similar products. 4,050,406, Cl. 118-19.000.
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Rennie, John: *See*—
Feingold, Robert M.; Hoover, Carl W., Jr.; and Rennie, John, 4,051,403, Cl. 313-105.0CM.
Rentschler, Waldemar; and Starp, Franz, to Carl Zeiss Stiftung. Single lens reflex camera with interchangeable lens. 4,051,495, Cl. 354-152.000.
Reuter, Franz Gottfried; and Menzel, Tankred, to Reuter Maschinen et al. Electrical conductive lacquer. 4,051,094, Cl. 260-29.60M.
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Reuter, Franz Gottfried; and Menzel, Tankred, 4,051,094, Cl. 260-29.60M.
Reynolds, George A.: *See*—
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Rhone-Poulenc-Textile: *See*—
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Rice, Clifford Brant; and Mastroianni, David Paul, to Rice Packaging Inc. Carton end closure and reinforcing construction. 4,050,625, Cl. 229-38.000.
Rice, Jessie A. Multi-angle sander. 4,050,194, Cl. 51-128.000.
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Rice, Clifford Brant; and Mastroianni, David Paul, 4,050,625, Cl. 229-38.000.
Richard, Douglas B. Roll-up truck cover assembly. 4,050,734, Cl. 296-98.000.
Richard Wolf GmbH: *See*—
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Richards, Mildred C.: *See*—
Samour, Carlos M.; and Richards, Mildred C., 4,051,158, Cl. 260-404.500.
Richman, Edward B., to Avery International Corporation. Single substrate tab fastener. 4,050,121, Cl. 24-73.0VA.
Richter, Reinhard H.; Tucker, Benjamin W.; and Ulrich, Henri, to Upjohn Company, The. Araliphatic diisocyanates. 4,051,166, Cl. 260-453.0AR.
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Ricoh Co., Ltd.: *See*—
Koizumi, Yutaka; and Iwanaga, Yoshiharu, 4,050,812, Cl. 355-66.000.
Kondoh, Mitsuru, 4,051,537, Cl. 358-264.000.
Miyakawa, Seiichi; and Eda, Tadahiro, 4,050,806, Cl. 355-14.000.
Yamauchi, Satoshi; and Yamazaki, Shigeru, 4,050,165, Cl. 35-8.00A.
Ridgeway, Rex L. Portable water bailing device for a boat. 4,050,396, Cl. 114-183.00R.
Riede, Gerhard, to Gambro AG. Device for diffusion of substances between two fluids through semipermeable membranes. 4,051,041, Cl. 210-321.00B.
Riemann, Hanns-Helmut: *See*—
Luchsinger, Peter; Muckenheim, Heribert; Riemann, Hanns-Helmut; Sonnenschein, Hans; and Michel, Erich, 4,050,387, Cl. 110-8.00A.
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Rigassi, Norbert: *See*—
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Riggs, Ray Vere: *See*—
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Rigo, Larry E. Junction box terminal block. 4,050,770, Cl. 339-198.00G.
Rigsby, Jesse H., to Pan-X Corporation. Telephone alarm system. 4,051,327, Cl. 179-5.00R.
Riken Keikinzoku Kogyo Kabushiki Kaisha: *See*—
Takahashi, Toshiro; Nagano, Toshihiro; Iguchi, Shozo; Kikuchi, Masaru; Nakamura, Katsuhiko; and Mochizuki, Atsushi, 4,050,142, Cl. 29-403.000.
Riker Laboratories, Inc.: *See*—
Schuppan, Dietrich; Gerster, John F.; and Leir, Charles M., 4,051,247, Cl. 424-258.000.
Rist, Karl Frederick, III: *See*—
Verkins, Wayne R.; Podvin, Richard T.; and Rist, Karl Frederick, III, 4,050,971, Cl. 156-69.000.
Ritzmann, Horst: *See*—
Goldmann, Wolf; Schepers, Georg; Heinemann, Otto; Schmits, Heinz-Herbert; and Ritzmann, Horst, 4,050,883, Cl. 432-14.000.
Roach, Charles J., to Pall Corporation. Vortex air cleaner assembly with acoustic attenuator. 4,050,913, Cl. 55-276.000.
Roach, Charles J.: *See*—
Pall, David B.; and Roach, Charles J., 4,050,237, Cl. 60-39.080.
Robbins, Dennis R. Remote control for an arc welding machine. 4,051,344, Cl. 219-132.000.
Robbins, Joseph Henry, deceased (by Guy, George Trevor Palfreyman

and Roger Jerome, executors); and Acton, John Edward, to Tangye Limited. Hydraulic jack. 4,050,674, Cl. 254-93.00H.
Robert Bosch G.m.b.H.: *See—*
Adalbert, Gerhard; Hess, Jurgen; and Hecht, Ulrich, 4,050,263, Cl. 62-243.000.
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Reibetanz, Wilbert; Wanner, Karl; and Hahner, Reinhard, 4,050,345, Cl. 85-68.000.
Robinson, Charles A., to American Home Products Corporation (Del.). Intermediates for preparing cephalosporins. 4,051,131, Cl. 544-28.000.
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Anders, Ronald J., 4,050,836, Cl. 408-20.000.
Hooker, Marvin L., Jr., 4,051,473, Cl. 343-7.00A.
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Rocquet, Francois Louis Albert: *See—*
Mattioda, Georges Dominique; and Rocquet, Francois Louis Albert, 4,051,244, Cl. 424-250.000.
Rode, Daniel Leon, to Bell Telephone Laboratories, Incorporated. Growing smooth epitaxial layers on misoriented substrates. 4,050,964, Cl. 148-171.000.
Rodionov, Jury Nikolaevich: *See—*
Lavrentiev, Konstantin Nikitich; Borisova, Natalya Isaakievna; Vasiliev, Jury Ivanovich; Rodionov, Jury Nikolaevich; Strashinsky, Vadim Konstantinovich; Ioffe, Vladimir Fedorovich; and Vyatskin, Iosif Yakovlevich, deceased, 4,051,422, Cl. 318-570.000.
Roetling, Paul G., to Xerox Corporation. Electronic halftone imaging system. 4,051,536, Cl. 358-298.000.
Rogers, George Alvin, to Modesett Engineering & Mfg. Mounting bracket. 4,050,663, Cl. 248-316.00A.
Rogers, Jack M.: *See—*
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Roggenkamp, Ray Lawrence: *See—*
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Rohrl, Franz; Ackermann, Josef; and Detterbeck, Heinrich, to Siemens Aktiengesellschaft. Method and apparatus for baking food in a closed cooking space in which heated air is circulated. 4,051,347, Cl. 219-400.000.
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Rollett, John Mortimer: *See—*
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Rolls-Royce Motors Limited: *See—*
Hawksworth, Frederick James, 4,050,320, Cl. 74-112.000.
Rolls-Royce (1971) Limited: *See—*
Needham, Peter Richard; and Langley, Kenneth Richard, 4,050,843, Cl. 415-116.000.
Romick, Rowland C., to Eaton Corporation. Four-wheel drive vehicle with drive transfer gear assembly. 4,050,328, Cl. 74-711.000.
Ronco, Karl, to Ciba-Geigy Corporation. Disazo pigments containing tetracarboxylic acid ester groups. 4,051,122, Cl. 260-174.000.
Rose, John Brewster: *See—*
Barr, Dennis Arthur; and Rose, John Brewster, 4,051,109, Cl. 260-49.000.
Rose, Larry Edward; and Lawrence, Norman Francis, to General Foods Corporation. Method of making puffed dough pieces of varying configuration. 4,051,162, Cl. 426-448.000.
Rose, Leslie C.: *See—*
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Rosenthal, Bruce David; and Dingwall, Andrew Gordon Francis, to RCA Corporation. Circuit for starting current flow in current amplifier circuits. 4,051,392, Cl. 307-297.000.
Roser, Horst R.: *See—*
Arndt, Erhard; Brodmann, Nikolaus; and Roser, Horst R., 4,050,984, Cl. 176-60.000.
Rosnowski, Wojciech; and Ponczak, Samuel, to RCA Corporation. Method of selective aluminum diffusion. 4,050,967, Cl. 148-189.000.
Ross, Donald R., Jr., to U-S Safety Trolley Corporation. Trolley rail assembly. 4,050,555, Cl. 191-23.00A.
Ross, Richard: *See—*
Neal, Ronald D.; Ross, Richard; and Hein, Joseph N., 4,050,651, Cl. 244-15.000.
Rossio, John H., to LaRos Equipment Company, Inc. Belt conveyor. 4,050,575, Cl. 198-834.000.
Rosvold, Warren C., to Raytheon Company. Semiconductor structures. 4,051,507, Cl. 357-60.000.
Roszkowski, Theodore R.: *See—*
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Roth, Marvin E.; and Vallere, Donald J., to Western Electric Company, Inc. Sputtering apparatus. 4,051,010, Cl. 204-298.000.
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Rowan, Robert A. Combined turnplow and subsoiler. 4,050,521, Cl. 172-196.000.
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Stephens, Frederick N.; Rowlett, Glenford; and Beard, James D., 4,050,222, Cl. 53-381.00R.
Roy, Leo T., to Craft, Inc. Easel hinge construction. 4,050,117, Cl. 16-178.000.
Rubinfeld, Joseph: *See—*
Godfrey, John Carl; and Rubinfeld, Joseph, 4,051,315, Cl. 536-10.000.
Ruby, Max H. Stoma irrigation system. 4,050,461, Cl. 128-227.000.
Rucker, Dieter: *See—*
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Rudy, Christopher John, to Thresher Institutes Incorporated. Accurate adjustable sling-shot. 4,050,439, Cl. 124-20.00R.
Ruhnau, Gerhard; Gudat, Wolfgang; Liermann, Peter; and Hesse, Karl-Heinz, to WABCO Westinghouse GmbH. Digital wheel speed circuit arranged to compensate for dimensional irregularities of sensor rotor member. 4,050,747, Cl. 303-95.000.
Ruppert, Juergen: *See—*
Sauer, Gerhard; Hauser, Helmut; Haffer, Gregor; Ruppert, Juergen; Eder, Ulrich; and Wiechert, Rudolf, 4,051,188, Cl. 260-590.0FA.
Russell, James T., to Jacobs, Eli S. Optical data record copier having array of lenses with field gaps aligned with data gaps. 4,050,811, Cl. 355-46.000.
Russell, Robert G., to Owens-Corning Fiberglas Corporation. Method and apparatus for forming kinky fibers from glass. 4,050,916, Cl. 65-2.000.
Ruti Machinery Works Ltd.: *See—*
Muller, Walter, 4,050,481, Cl. 139-436.000.
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S.A.E.S. Getters S.p.A.: *See—*
Murphy, David R., 4,050,914, Cl. 55-387.000.
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Salice, Luciano, 4,050,116, Cl. 16-163.000.
Saari, Walfred S., to Merck & Co., Inc. Amino acid esters. 4,051,169, Cl. 560-40.000.
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Tsuchihashi, Genichi; and Ogura, Katsuyuki, 4,051,151, Cl. 260-329.00S.
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Gates, Peter Stuart; Gillon, John; and Saggers, David Thomas, 4,051,154, Cl. 260-346.220.
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Saito, Mitsuo: *See—*
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Saito, Takeo; and Seki, Youichi, to Seiko Koki Kabushiki Kaisha. Exposure time control device for electric camera shutter. 4,051,489, Cl. 354-23.00D.
Saito, Toshihisa: *See—*
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Saitou, Tadashi: *See—*
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Sakai, Kiyotoshi. Method and apparatus for controlling the furnace top gas pressure of blast furnaces. 4,050,679, Cl. 266-44.000.
Sakai, Naomi: *See—*
Shimomura, Raiji; Habu, Toru; Itoh, Hisaaki; Sakai, Naomi; and Goto, Tatsuo, 4,050,293, Cl. 73-105.000.
Sakai, Toshimitsu; Saitou, Tadashi; and Suzuki, Isamu, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisan Kogyo Kabushiki Kaisha. Diaphragm pump. 4,050,861, Cl. 417-471.000.
Sakamaki, Hiroshi; and Maeda, Toshiyuki, to Nippon Piston Ring Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Dry air rotary pump or compressor. 4,050,855, Cl. 418-131.000.
Sakamoto, Eiichi: *See—*
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Sakamoto, Yoshio: *See—*
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Sala, Angelo: *See—*
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Sales, Maurice, to Societe Pyreneenne du Silico-Manganese. Process for the passivation of ferrosilicon. 4,050,957, Cl. 148-6.300.
Salice, Luciano, to S.A.R. L. Salice France. Self-closing hinge. 4,050,116, Cl. 16-163.000.
Saligny, Claude: *See—*
Bolliand, Robert; and Saligny, Claude, 4,050,982, Cl. 162-100.000.

Salzgeber, Daniel Edwin: *See*—
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Samardzija, Cheryl: *See*—
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Samardzija, Momcilo M.; and Samardzija, Cheryl, to Raymond Lee Organization, Inc., The. Hamper and cart. 4,050,708, Cl. 280-47.260.

Samour, Carlos M.; and Richards, Mildred C., to Kendall Company, The. Monomeric emulsion stabilizers derived from alkyl/alkenyl succinic anhydride. 4,051,158, Cl. 260-404.500.

Samuel Bingham Co.: *See*—
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Samuel Moore and Company: *See*—
Thomas, Robert J.; and Jones, Marvin H., 4,050,327, Cl. 74-502.000.

Samuelson, Hans Olof: *See*—
Jamieson, Allan Geoffrey; Samuelson, Hans Olof; Smedman, Leif Ake; and Sondell, Kent Ivar, 4,050,981, Cl. 162-37.000.

Sanchez, Anacleto Montero. Hypodermic syringe. 4,050,459, Cl. 128-218.00C.

Sanderow, Howard I.; and Merz, Kenneth M., to Stanadyne, Inc. Impervious metal object and method of making the same. 4,050,933, Cl. 75-246.000.

Sanders Associates, Inc.: *See*—
Hayner, Paul F.; Eldridge, David G.; Bernier, Edgar R.; and Henderson, Richard B., 4,050,476, Cl. 137-625.620.

Sanders, Franklin C. Velocity sensitive dual rate shock strut. 4,050,684, Cl. 267-65.00R.

Sanderson, Charles H. Method and apparatus for treating liquid fuel. 4,050,426, Cl. 123-119.00E.

Sanderson, Gary Warner; Hoefler, Andrew Charles; Graham, Harold Nathaniel; and Coggon, Philip, to Thomas J. Lipton, Inc. Cold water extractable tea leaf and process. 4,051,264, Cl. 426-52.000.

Sandoz, Inc.: *See*—
Anderson, Paul L.; and Nadelson, Jeffrey, 4,051,261, Cl. 424-331.000.

Sandoz Ltd.: *See*—
Altermatt, Ruedi, 4,051,120, Cl. 260-158.000.
Dore, Jacky, 4,051,116, Cl. 260-145.00A.
Tcherkinsky, Boris; and Wasem, Hans, 4,051,121, Cl. 260-174.000.

Sanford, Emerson Cecil: *See*—
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Sanford, Gary G.: *See*—
Murphy, Lawrence R.; and Sanford, Gary G., 4,051,477, Cl. 343-700.0MS.

Sankyo Company Limited: *See*—
Shimizu, Bunji; Saito, Akio; Kaneko, Masakatsu; Yanagisawa, Hiroaki; and Nakao, Hideo, 4,051,129, Cl. 544-21.000.
Yanagisawa, Hiroaki; Ando, Akiko; Fukushima, Masami; and Nakao, Hideo, 4,051,320, Cl. 542-420.000.

Sanpei, Kiyoji: *See*—
Ishihara, Takao; Sanpei, Kiyoji; Nabatame, Hiroshi; and Motokawa, Shoichi, 4,050,910, Cl. 55-96.000.

SAPAL Societe Anonyme des Plieuses Automatiques: *See*—
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Sarace, John C.: *See*—
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Sarjeant, Walter J., to Canadian Patents & Development Limited. Attenuator for measuring high voltage fast rise time pulses. 4,051,432, Cl. 324-72.500.

Sasaki, Shiro: *See*—
Yamada, Makoto; Sasaki, Shiro; Kanazawa, Shigenori; and Hayashi, Yoshihiro, 4,050,717, Cl. 280-744.000.

Sasaki, Susumu: *See*—
Takemura, Takeshi; Katoh, Yoshihisa; Kurita, Shigeyuki; Sasaki, Susumu; Funabiki, Kyohei; and Hatano, Keizo, 4,051,098, Cl. 260-38.000.

Sato, Katsujiro: *See*—
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Hancock, Warren D.; and Sattler, Frederick P., 4,050,893, Cl. 8-94.110.

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Cohen, Noal; and Saucy, Gabriel, 4,051,153, Cl. 260-345.500.

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Saurer-Allma GmbH Allgauer Maschinenbau: *See*—
Berend, Wolfgang, 4,050,227, Cl. 57-34.500.

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Boyer, Jo Clara, 4,050,268, Cl. 66-19.000.

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Okamoto, Tomiyasu; Nishimoto, Tsunanori; Sawada, Kaoru; Hayakawa, Koji; and Kurihara, Tomomichi, 4,050,609, Cl. 220-9.0LG.

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Sayce, Ethel Margaret Lindsay, executrix: *See*—
Sayce, Leonard Alfred, deceased; and Pettigrew, Robert Martin, 4,051,367, Cl. 250-237.00G.

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Schaab, Rudolph S.; and Harralson, John C. Sliver high pile fabric knitting machine. 4,050,267, Cl. 66-9.00B.

Schaar, Charles H., to Colgate-Palmolive Company. Diapers. 4,050,463, Cl. 128-287.000.

Schacht, Erich; Mehrhof, Werner; Simane, Zdenek; Kayser, Detlev; and Nowak, Herbert, to Merck Patent Gesellschaft mit beschrankter Haftung. Diphenoxyacetic acid derivatives. 4,051,170, Cl. 560-62.000.

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Schaefer, Hartmann: *See*—
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Schapov, Valentin Andrianovich: *See*—
Zaikovsky, Vladimir Borisovich; Kutuzov, Jury Prokhorovich; Zakharov, Mikhail Fedorovich; Kavtaev, Evgeny Emelyanovich; Poedinschikov, Jury Grigorievich; Bazhanov, Jury Mikhailovich; and Schapov, Valentin Andrianovich, 4,050,288, Cl. 72-468.000.

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Heissler, Herbert; Hitsch, Eckart; and Scheer, Wolfgang, 4,050,997, Cl. 204-28.000.

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Pollinger, Hans; and Scheffel, Bernd, 4,050,553, Cl. 188-203.000.

Scheithauer, Eric A., to Cook Electric Company. Gas tube arrester protector. 4,051,546, Cl. 361-124.000.

Schepers, Georg: *See*—
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Schering Aktiengesellschaft: *See*—
Junghans, Klaus, 4,050,998, Cl. 204-59.00R.
Sauer, Gerhard; Hauser, Helmut; Haffer, Gregor; Ruppert, Juergen; Eder, Ulrich; and Wiechert, Rudolf, 4,051,188, Cl. 260-590.0FA.

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Protzman, Walter P.; and Evans, George L., 4,051,232, Cl. 424-12.000.

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Scherrer, Kurt, to U. Scharer Sohne AG, (USM). Braceable rail. 4,050,753, Cl. 312-257.0SK.

Scheuer, Raymond I.: *See*—
Thomas, Richard E.; Florence, Robert T.; Dalal, Rustom H.; and Scheuer, Raymond I., 4,051,283, Cl. 428-29.000.

Schichman, Daniel: *See*—
Neville, James J.; Ferrell, Wesley; and Schichman, Daniel, 4,050,>73, Cl. 156-123.00R.

Schimitschek, Erhard J.: *See*—
Hammond, Peter R.; Schimitschek, Erhard J.; and Trias, John A., 4,051,062, Cl. 252-301.170.

Schlegel, Fred, to Eaton Corporation. Method and apparatus for aligning a valve head. 4,050,275, Cl. 72-92.000.

Schlussler, Hans-Joachim: *See*—
Bowing, Walter Grosse; Mrozek, Hinrich; Schlussler, Hans-Joachim; Tinnefeld, Bernd; and Vogele, Peter, 4,051,058, Cl. 252-186.000.
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Schmedemann, Walter; and Hecker, Wolfgang, to U.S. Philips Corporation. Device for braking a counterweight in an x-ray examining apparatus. 4,050,551, Cl. 188-181.00C.

Schmidt, Fred L.; and Steffes, Frank J., to Crown Zellerbach Corporation. Selective delamination of wood chips. 4,050,980, Cl. 162-24.000.

Schmidt, Louis Charles; and Farbolin, Richard P., to Schmidt, Trustee under Harry J. Hoenselaar Trust Agreement of Oct. 4, 1973, Mary Jane. Spiral meat slicer with improved reciprocating knife structure. 4,050,370, Cl. 99-538.000.

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Schmitt, Ewald, to Messer Griesheim GmbH. Device for linear measurement. 4,050,160, Cl. 33-141.00B.

Schneehage, Henning: *See—*
Koester, Eberhard; Wunsch, Gerd; Schoenafinger, Eduard; and Schneehage, Henning, 4,050,962, Cl. 148-105.000.

Schneider, Myles Z.: *See—*
Chasanoff, Daniel; and Schneider, Myles Z., 4,050,156, Cl. 32-2.000.

Schober, Franz, to Bayerisches Leichtmetallwerk Graf Blucher von Wahlstatt KG. Method and apparatus for forging bevel gears. 4,050,283, Cl. 72-344.000.

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Scholten, James R., to United States of America, Navy. Catoptric lens arrangement. 4,050,775, Cl. 350-200.000.

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Schroter, Friedrich. Process and apparatus for blanking cardboard and the like. 4,050,362, Cl. 93-58.00R.

Schubert & Salzer Maschinenfabrik Aktiengesellschaft: *See—*
Landwehrkamp, Hans; Hoeber, W. Gerhard; Goldammer, Georg; and Oexler, Rudolf, 4,050,228, Cl. 57-58.950.

Schuetz, Adolph August; and Bossak, Gary Edward, to Combustion Engineering, Inc. Discriminating flame detector. 4,051,375, Cl. 250-372.000.

Schulte, Klaus: *See—*
Raffel, Reiner; Ebeling, Wilfried; Nadolski, Klaus; and Schulte, Klaus, 4,050,896, Cl. 23-230.00A.

Schulz, Wallace W., to United States of America, Energy Research and Development Administration. Method for purifying bidentate organophosphorus compounds. 4,051,203, Cl. 260-990.000.

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Schuppan, Dietrich; Gerster, John F.; and Leir, Charles M., to Riker Laboratories, Inc. Method of using 7-hydroxy-benzo[ij]quinolizine-2-carboxylic acid derivatives. 4,051,247, Cl. 424-258.000.

Schurz, James L., to Farmhand, Inc. Bale wagon. 4,050,598, Cl. 214-518.000.

Schwartz, Samuel, to Intel Corporation. Apparatus and method for composing digital information on a data bus. 4,051,358, Cl. 364-716.000.

Schwarzkopf Development Corporation: *See—*
Bodem, Johann; and Raine, Thomas, 4,050,127, Cl. 407-107.000.

Schweickart, Albert John; Collins, Stephen Michael; and Bortak, John Joseph, to BASF Wyandotte Corporation. Bipolar electrolytic filter press cell frame. 4,051,009, Cl. 204-279.000.

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Kubelka, Axel; and Schweizer, Gottfried, 4,050,716, Cl. 280-614.000.

Schwieter, Ulrich: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 4,051,319, Cl. 542-413.000.

Schwippert, Guustaaf Arthur; and Van Zeggeren, Wilhelm Aart, to Mars, Inc. Banknote escrow and stacker apparatus and method. 4,050,562, Cl. 194-4.00E.

Schwoerer, Danial W.: *See—*
Ahlgren, Raymond E.; Schwoerer, Danial W.; and Lundstrom, Boyce H., 4,050,947, Cl. 106-52.000.

Scoggins, Lacey E.; and Campbell, Robert W., to Phillips Petroleum Company. Copolyamide. 4,051,087, Cl. 260-18.00N.

Scott, Harley D., to Cyclops Corporation. Controlled destructive panel assembly. 4,050,204, Cl. 52-262.000.

Scott, Hubert D.: *See—*
Arnold, Dan M.; Paap, Hans J.; and Scott, Hubert D., 4,051,368, Cl. 250-270.000.

Scott, Randall Dean: *See—*
Steranko, James Joseph; Rogoff, Gerardo; Scott, Randall Dean; Gallagher, Angela Frances; and Burger, Peter, 4,051,459, Cl. 364-900.000.

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Secor, Arthur D., to Great Lakes Industries, Inc. Expandable coreshafts. 4,050,643, Cl. 242-72.00R.

Sedam, Jason K.: *See—*
Amon, Anton; and Sedam, Jason K., 4,051,034, Cl. 210-206.000.

Seddon, Peter: *See—*
Bromfield, Ian Derek; and Seddon, Peter, 4,050,817, Cl. 355-133.000.

Sedlacek, Raymond. Lunch bucket and beverage bottle combination. 4,050,581, Cl. 206-544.000.

Segre, Eugene J., to Syntex (U.S.A.) Inc. Method of treating diseases by daily administration of 6-chloro-11β,17α,21-trihydroxypregna-1,4,6-triene-3,20-dione. 4,051,241, Cl. 424-243.000.

Seiko Koki Kabushiki Kaisha: *See—*
Kitai, Kiyoshi, 4,051,498, Cl. 354-234.000.
Saito, Takeo; and Seki, Youichi, 4,051,489, Cl. 354-23.00D.

Seitz, Peter. Conveyor for stacking cases in a run-through storage structure. 4,050,561, Cl. 193-35.00R.

Seiverling, John S., to Aladdin Industries, Incorporated. Emergency mantle lamp for a gas stove. 4,050,442, Cl. 126-213.000.

Seki, Kunio; Suzuki, Yukio; and Sakamoto, Yoshio, to Hitachi, Ltd. Differential amplifier. 4,051,443, Cl. 330-258.000.

Seki, Youichi: *See—*
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Sendelweck, Gene Karl, to RCA Corporation. Burst gate pulse generator. 4,051,518, Cl. 358-20.000.

Seno, Shougo; Toyama, Tatsuro; Takai, Teruo; and Ueda, Yasuomi, to Hitachi, Ltd. Thick film integrated circuits. 4,051,550, Cl. 361-402.000.

Senoo, Tadao; and Honda, Kenji, to Ube Nitto Kasei Co., Ltd.; and Toyo Rope Manufacturing Co., Ltd. Rope. 4,050,230, Cl. 57-149.000.

Senske, Roger Alvin: *See—*
Andrews, Michael Joseph; Davis, William Allen; and Senske, Roger Alvin, 4,050,294, Cl. 73-105.000.

Senter, Jonas. Article of footwear with a three-dimension inset figure in its recessed sole and method of making the same. 4,050,167, Cl. 36-32.00R.

Sequin, Carlo Heinrich: *See—*
Krambeck, Robert Harold; Sequin, Carlo Heinrich; and Walden, Robert Henry, 4,051,505, Cl. 357-24.000.

Seres, Jeno: *See—*
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Sethna, Darius N.: *See—*
Winter, Heinrich; and Sethna, Darius N., 4,050,147, Cl. 29-599.000.

Seubert, Jurgen; Pohlke, Rolf; Thomas, Herbert; and Andrews, Peter, to Merck Patent Gesellschaft mit beschrankter Haftung. Ring substituted pyrazino-isoquinoline derivatives and their preparation. 4,051,243, Cl. 424-250.000.

Shaffer, David T.: *See—*
Harris, Robert M.; Mills, Gene F.; and Shaffer, David T., 4,050,603, Cl. 220-3.900.

Shah, Navinchandra Bhogilal: *See—*
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Shakertown Corporation: *See—*
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Shakespear, Horacio: *See—*
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Sharpe, William N., Jr.; and Hollenberg, Glenn W., to United States of America, Air Force. Method for determining changes in spacing between two positions of interest. 4,050,818, Cl. 356-32.000.

Sharps Associates: *See—*
Razdan, Raj Kumar; Dalzell, Haldean Cloyce; and Herlihy, Patricia, 4,051,152, Cl. 260-345.300.

Shatterproof Glass Corporation: *See—*
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Shaw, Wilfrid G.; and Terrill, David B., to Standard Oil Company, The. Preparation of acrylic acid and methacrylic acid. 4,051,180, Cl. 260-530.00N.

Sheets, Herman E. Hydrodynamic transmission for ship propulsion. 4,050,849, Cl. 416-171.000.

Sheldon, Luther M., to General Electric Company. Cap and connector for five-wire applications. 4,050,774, Cl. 339-264.00R.

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Binsbergen, Frederik L.; and Van Namen, Dick J., 4,051,051, Cl. 252-59.000.
Pilgram, Kurt H. G., 4,050,918, Cl. 71-86.000.
Staudinger, Gernot; and Naber, Jaap E., 4,051,226, Cl. 423-244.000.

Shepard, Alvin F.; and Dannels, Bobby F., to Hooker Chemicals & Plastics Corporation. Cyclic ethers of phenolic compounds and polymers thereof. 4,051,189, Cl. 260-619.00A.

Sheppard, William L., to AVM Corporation. Fluid valve. 4,050,472, Cl. 137-242.000.

Shibayama, Kyoichi; Ono, Hiroshi; Jidai, Eiki; and Fujii, Akira, to Mitsubishi Denki Kabushiki Kaisha. Water-dispersion varnish for electrodeposition and process for making said water dispersion varnish. 4,051,091, Cl. 260-29.2TN.

Shibuya, Morioki: *See—*
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Shichida, Hiromichi; Katsube, Hideo; Oyama, Shigeaki; Toyoda, Kenichi; and Saito, Mitsuo, to Fujitsu Fanuc Limited. Drilling machine with automatic tool changer. 4,050,837, Cl. 408-35.000.

Shields, James R., Jr. Film-sound synchronization system. 4,050,794, Cl. 352-12.000.

Shiga, Shujiro; Katsumata, Takeshi; Okamoto, Yasushi; and Hikasa, Tadashi, to Sumitomo Chemical Company, Limited. Method for the heat recovery in the processes of the removal of nitrogen oxides from exhaust gases. 4,051,225, Cl. 423-235.000.

Shigenobu, Masahiro: *See—*
Yamamoto, Yoshihiko; Shigenobu, Masahiro; and Kuwabara, Hideo, 4,051,045, Cl. 250-536.000.

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Shimada, Katsuji; and Shimada, Katsuyuki, 4,050,622, Cl. 229-19.000.

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Shimada, Satoshi: *See*—
Takeuchi, Kouichi; Itoh, Norio; Koyama, Kuniyoshi; Shimada, Satoshi; and Himuro, Masami, 4,051,513, Cl. 358-60.000.
Shimada, Wataru; and Hiramoto, Seigo, to Mitsubishi Denki Kabushiki Kaisha. Method of removing surface defects of a steel product. 4,050,958, Cl. 148-9.500.
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Imanari, Mamoru; Takeuchi, Makoto; Shimizu, Shozo; and Higuchi, Hisashi, 4,051,429, Cl. 324-.50A.
Shimomura, Raiji; Habu, Toru; Itoh, Hisaaki; Sakai, Naomi; and Goto, Tatsuo, to Hitachi, Ltd.; and Hitachi Metals, Ltd. Device for detecting the unevenness of a curved surface. 4,050,293, Cl. 73-105.000.
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Shinoki, Takanori: *See*—
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Hobbs, Jim F.; and Smyser, Craig, 4,050,900, Cl. 23-277.00R.
Shires, Philip John; and Kennedy, Timothy James, to Procter & Gamble Company, The. Dry low calorie beverage crystals. 4,051,268, Cl. 426-548.000.
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Shoji, Akio: *See*—
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Shono, Tetsuji: *See*—
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Short, Clifton Stanley. Process and apparatus for drying grain in situ. 4,050,163, Cl. 34-22.000.
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Shults, Otto C.; and Boddicker, Major L. Sound producer. 4,050,186, Cl. 46-180.000.
Shultz, William E. Bearing race driver. 4,050,136, Cl. 29-724.000.
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Wu, Ching H.; Brown, Alfred; Huang, Wann-Sheng; and Shum, Yick-Mow, 4,050,513, Cl. 166-274.000.
Shy, James L.: *See*—
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Rohrl, Franz; Ackermann, Josef; and Detterbeck, Heinrich, 4,051,347, Cl. 219-400.000.
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Kobiella, Robert J., 4,050,372, Cl. 100-2.000.
Silver, Jules: *See*—
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Silverberg, Morton, to Xerox Corporation. Liquid ink imaging system. 4,050,804, Cl. 355-10.000.
Simak, Petr; Herrle, Karl; Haaf, Franz; and Hatzmann, Guenter, to BASF Aktiengesellschaft. Thermoplastic vinyl chloride polymer compositions with improved processing properties. 4,051,200, Cl. 260-899.000.
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Simpson, Earl L. Vehicle luggage carrier. 4,050,614, Cl. 224-29.00R.
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SKF Nova AB: *See*—
Lundgren, Bengt G. S.; and Ostling, Sture B. G., 4,050,949, Cl. 106-97.000.
Skingle, Thomas Jerome, to Acme-Cleveland Corporation. Radially adjustable rotary cutting tool. 4,050,840, Cl. 408-144.000.
Skoda, Stanislav: *See*—
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Slater, Charles A., Jr.; and Darby, Spencer, to Peterson Manufacturing Company. Lamp and mounting structure therefor. 4,051,360, Cl. 362-363.000.
Small, William M., to Phillips Petroleum Company. Stepwise turndown by closing heat exchanger passageways responsive to measured flow. 4,050,506, Cl. 165-1.000.
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Smedman, Leif Ake: *See*—
Jamieson, Allan Geoffrey; Samuelson, Hans Olof; Smedman, Leif Ake; and Sondell, Kent Ivar, 4,050,981, Cl. 162-37.000.
Smeltzer, Ronald K.; and Bean, Kenneth E., to Texas Instruments Incorporated. Process for thinning silicon with special application to producing silicon on insulator. 4,050,979, Cl. 156-647.000.
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Bussard, Leon M., 4,050,595, Cl. 214-84.000.
Smith, Charles S. Containerized liquid stirrer. 4,050,678, Cl. 366-130.000.
Smith, Hubert Stacy, to Dow Chemical Company, The. Insulation of vessels having curved surfaces. 4,050,607, Cl. 220-9.0LG.
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Smith, James K.: *See*—
Klein, Elias; Smith, James K.; and Morton, Frederick C., 4,051,300, Cl. 428-398.000.
Smith, Jerry L., to Telephone Utilities and Communications Industries, Inc. AC to DC power supply circuit. 4,051,425, Cl. 363-86.000.
Smith-Johannsen, Robert; and Moyer, Wendell W., Jr., to Raychem Corporation. Coated particles and conductive compositions therefrom. 4,051,075, Cl. 252-511.000.
Smith, Lennie R., to Raymond Lee Organization, Inc., The. Foot and leg brace. 4,050,455, Cl. 128-80.00F.
Smith, Michael John Stapley: *See*—
Nelson, Richard Stuart; Pugh, Stanley Frederick; and Smith, Michael John Stapley, 4,051,063, Cl. 252-301.10W.
Smith R.P.M. Corporation: *See*—
Smith, Roy R., Jr., 4,050,378, Cl. 101-147.000.
Smith, Richard E.: *See*—
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,050,688, Cl. 271-5.000.
Smith, Robert E., Jr.: *See*—
Anderson, Robert W., deceased; and Smith, Robert E., Jr., 4,051,324, Cl. 174-121.00R.
Smith, Roy E., to Owens-Corning Fiberglas Corporation. Cross-shaped joint cover member for generally rectangular composite insulating panels forming wall portion of insulated cryogenic liquid container. 4,050,608, Cl. 220-9.0LG.
Smith, Roy R., Jr., to Smith R.P.M. Corporation. Metered spray dampening system. 4,050,378, Cl. 101-147.000.
Smith, Wendell F., Jr; and Reynolds, George A., to Eastman Kodak Company. Photographic elements incorporating chelated-metal quenching compounds. 4,050,938, Cl. 96-84.00R.
Smithgall, Harry E., to GTE Sylvania Incorporated. Base and socket means for an electron tube. 4,050,763, Cl. 339-111.000.
Smyser, Craig: *See*—
Hobbs, Jim F.; and Smyser, Craig, 4,050,900, Cl. 23-277.00R.
Snook, James Chetwood, to Chloride Group Limited. Electric batteries. 4,051,304, Cl. 429-94.000.
Snyder, Jan S.; and Bright, Clark I., to Xerox Corporation. Method and apparatus for inverting the polarity of an input image formed on a surface of an image recording device. 4,051,463, Cl. 340-173.0TP.
Societa' Italiana Resine S.I.R. S.p.A.: *See*—
Piccolo, Luigi; Calcagno, Benedetto; and Bossi, Emilio, 4,050,951, Cl. 106-300.000.
S.A. Beauplat Fils & Cie: *See*—
Allemand, Pierre M., 4,050,337, Cl. 83-552.000.
Societe Anonyme D.B.A.: *See*—
Carre, Jean-Jacques; and Muterel, Roland, 4,050,251, Cl. 60-550.000.
Societe Anonyme dite: Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
Beauhaire, Pierre, 4,050,781, Cl. 350-96.00C.
Parent, Guy, 4,051,350, Cl. 364-432.000.
Societe Anonyme Dite: Societe Europeenne dePropulsion: *See*—
Stauff, Emile J., 4,050,351, Cl. 89-1.701.
Societe d'Etudes Generales de Communications Industrielles et Civiles-Segic: *See*—
Desenfant, Andre L., 4,050,538, Cl. 181-210.000.
Societe Pyreneenne du Silico-Manganese: *See*—
Sales, Maurice, 4,050,957, Cl. 148-6.300.
Sofrance S.A.: *See*—
Billault, Michel, 4,051,037, Cl. 210-236.000.
Softal Elektronik Erik Blumenfeld KG: *See*—
Sorensen, Bent, 4,051,044, Cl. 250-531.000.
Sokolowski, James H., to Upjohn Company, The. Treatment of genital tract diseases of domestic animals with prostaglandins. 4,051,238, Cl. 424-181.000.
Soleri, Richard A. Automatic carousel-type meat cutting machine. 4,050,339, Cl. 83-703.000.
Sondell, Kent Ivar: *See*—
Jamieson, Allan Geoffrey; Samuelson, Hans Olof; Smedman, Leif Ake; and Sondell, Kent Ivar, 4,050,981, Cl. 162-37.000.
Sondhe, Ratanjit S. Treatment material and method for exposed aggregate concrete casting. 4,050,943, Cl. 106-12.000.

Sonnenschein, Hans: *See—*
Luchsinger, Peter; Muckenheim, Heribert; Riemann, Hanns-Helmut; Sonnenschein, Hans; and Michel, Erich, 4,050,387, Cl. 110-8.00A.

Sonobe, Hiroshi; Kato, Masaaki; Matsuzawa, Hideo; Ishii, Hiromichi; and Kobayashi, Masao, to Mitsubishi Rayon Co., Ltd. Catalytic process for the preparation of unsaturated carboxylic. 4,051,179, Cl. 260-530.00N.

Sony Corporation: *See—*
Miyaoka, Senri, 4,051,529, Cl. 358-128.000.
Owaki, Masanao, 4,051,446, Cl. 331-116.00R.
Takeuchi, Kouichi; Itoh, Norio; Koyama, Kuniyoshi; Shimada, Satoshi; and Himuro, Masami, 4,051,513, Cl. 358-60.000.

Sordello, Frank J.: *See—*
Touchton, James J.; Cuda, John; and Sordello, Frank J., 4,051,423, Cl. 318-611.000.

Sorensen, Bent, to Softal Elektronik Erik Blumenfeld KG. Electric discharge surface treating apparatus. 4,051,044, Cl. 250-531.000.

Sotirianos, Konstantin: *See—*
Muller, Hans; and Sotirianos, Konstantin, 4,051,204, Cl. 261-36.00R.

South, William H.: *See—*
Kilgore, Lee A.; Taylor, Edgar R., Jr.; and South, William H., 4,051,427, Cl. 322-99.000.

Southard, Robert Keith: *See—*
Hopkins, John Root; Renn, Robert Maurice; and Southard, Robert Keith, 4,050,764, Cl. 339-103.00M.

Southgate, Donald Alan, to British Petroleum Company Limited, The. Method and apparatus for launching pipeline clearing spheres. 4,050,955, Cl. 134-8.000.

Souza, Thomas, Jr. Stairs and railing system for multi-floored buildings and method of constructing same. 4,050,203, Cl. 52-185.000.

Sowash, Thomas R.: *See—*
Watson, Richard D.; and Sowash, Thomas R., 4,050,771, Cl. 339-263.00R.

Spartus Corporation: *See—*
Jauch, Christian M. J., 4,050,236, Cl. 58-132.000.

Spence-Bate, Harry Arthur Hele. Microfiche handling device. 4,050,687, Cl. 271-3.100.

Sperotto Brevetti S.p.A.: *See—*
Vecchia, Gino Dalla, 4,050,270, Cl. 68-158.000.

Sperry Rand Corporation: *See—*
Davies, Michael LaVar; Johnson, Richard Servern; Noker, Alvin John; and Wilde, Veldon Lawrence, 4,050,568, Cl. 197-90.000.
Matthews, Hugh B., 4,050,517, Cl. 166-315.000.
Touchton, James J.; Cuda, John; and Sordello, Frank J., 4,051,423, Cl. 318-611.000.

Spinks, Ray E.: *See—*
Turner, James Wesley, deceased; and Spinks, Ray E., 4,050,122, Cl. 24-230.00A.

Spivack, John D.; and Luzzi, John J., to Ciba-Geigy Corporation. Benzoyloxybenzoates and compositions stabilized therewith. 4,051,104, Cl. 260-45.85B.

Stal-Laval Turbin AB: *See—*
Torstenfelt, N. A. Ragnar, 4,050,560, Cl. 192-85.0AT.

Stanadyne, Inc.: *See—*
Davis, Charles W.; Raufeisen, Robert; and Salzgeber, Daniel Edwin, 4,050,432, Cl. 123-139.0AQ.
Sanderow, Howard I.; and Merz, Kenneth M., 4,050,933, Cl. 75-246.000.

Stanbridge, David W.: *See—*
McNamee, Gerald P.; Roszkowski, Theodore R.; Stanbridge, David W.; and White, Gerald A., 4,050,908, Cl. 48-210.000.

Standard Oil Company, The: *See—*
Shaw, Wilfrid G.; and Terrill, David B., 4,051,180, Cl. 260-530.00N.

Standard Telephones and Cables Ltd.: *See—*
Weston, Martin, 4,051,516, Cl. 358-11.000.

Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., to Xerox Corporation. Orthogonal document handling apparatus. 4,050,688, Cl. 271-5.000.

Stange, Klaus K., to Xerox Corporation. Document carousel. 4,050,751, Cl. 312-197.000.

Stanley, Richard B. Linear actuator. 4,050,319, Cl. 74-89.150.

Stanley Works, The: *See—*
Hildebrandt, William J., 4,050,841, Cl. 408-213.000.

Stanwick, Casmer P.; and Jordan, Lawrence E., to General Electric Company. Dynamoelectric machine including gas baffles. 4,051,399, Cl. 310-51.000.

Starp, Franz: *See—*
Rentschler, Waldemar; and Starp, Franz, 4,051,495, Cl. 354-152.000.

Staudinger, Gernot; and Naber, Jaap E., to Shell Oil Company. Prevention of explosive mixtures in the regeneration of sulfur oxide acceptors. 4,051,226, Cl. 423-244.000.

Stauff, Emile J., to Societe Anonyme Dite: Societe Europeenne de Propulsion. Assembly for launching a projectile. 4,050,351, Cl. 89-1.701.

Stauffer Chemical Company: *See—*
Arneklev, Duane R.; Baker, Don R.; and Walker, Francis H., 4,051,184, Cl. 260-559.00B.
Baker, Don R.; and Walker, Francis H., 4,050,923, Cl. 71-118.000.
Gutman, Arnold D., 4,051,239, Cl. 424-211.000.
Pallos, Ferenc M.; Lee, Hwalin; and Menn, Julius J., 4,051,262, Cl. 424-337.000.
Pitt, Harold M., 4,051,182, Cl. 260-544.00Y.
Weil, Edward D., 4,051,201, Cl. 260-930.000.

Stauner, Thomas: *See—*
Piller, Bernhard; Lenoir, John; Froehlich, Alfred; Stauner, Thomas; and Tschopp, Paul, 4,051,123, Cl. 260-178.000.

Stead, Cecil Vivian: *See—*
Andrew, Herbert Francis; Stead, Cecil Vivian; and Thompson, Ronald, 4,051,175, Cl. 260-502.500.

STEAG Aktiengesellschaft: *See—*
Kleeberg, Ulrich; Leimkuhler, Jurgen; Knospe, Jurgen; and Stohr, Manfred, 4,050,871, Cl. 425-317.000.

Steeg, Emil; and Hoffmeyer, Uwe, to Automation Steeg and Hoffmeyer GmbH. Device for unpacking bottles or similar articles in a shrink foil package. 4,050,223, Cl. 53-381.00R.

Steel Company of Canada, Limited, The: *See—*
Prenn, Otto E., 4,050,514, Cl. 166-176.000.

Steenken, Gerhard E. W. K.: *See—*
Pannekeet, Wilhelmus; Steenken, Gerhard E. W. K.; and Voogd, Roeland H., 4,051,221, Cl. 423-54.000.

Steffes, Frank J.: *See—*
Schmidt, Fred L.; and Steffes, Frank J., 4,050,980, Cl. 162-24.000.

Stein, Walter. Cake of soap, especially for washing hands. 4,050,825, Cl. 401-19.000.

Steinbacher, Jack T., to Eaton Corporation. Method of making a shell mold. 4,050,500, Cl. 164-16.000.

Steiner, Alois, to Ruti Machinery Works Ltd. Apparatus for selective moving of lamella shaped heddles. 4,050,480, Cl. 139-55.100.

Steinkopf, Wolfgang Otto Gotthard; and Drabek, Rudolf, to U.S. Philips Corporation. Television system comprising a video storage device and a television receiver. 4,051,526, Cl. 358-127.000.

Steinmiller, William G., to Fiber Industries Inc. Synthetic fibers of enhanced processability. 4,051,299, Cl. 428-394.000.

Stemmle, Denis J., to Xerox Corporation. Document handling system. 4,050,816, Cl. 355-75.000.

Stenberg, Folke Gustav Adolf, to Iwema Forpacknings AB. Method of providing a package with a handle. 4,050,216, Cl. 53-14.000.

Stephens, Frederick N.; Rowlett, Glenford; and Beard, James D., to Stephens Industries, Inc. Envelope opening apparatus. 4,050,222, Cl. 53-381.00R.

Stephens Industries, Inc.: *See—*
Stephens, Frederick N.; Rowlett, Glenford; and Beard, James D., 4,050,222, Cl. 53-381.00R.

Steranko, James Joseph; Rogoff, Gerardo; Scott, Randall Dean; Gallagher, Angela Frances; and Burger, Peter, to Editext Word Processing, Inc. Stored program controlled typewriting/editing system. 4,051,459, Cl. 364-900.000.

Sterling Drug Inc.: *See—*
Johnson, Robert E., 4,051,147, Cl. 260-326.470.

Stern, Donovan P.: *See—*
Miksic, Boris A.; and Stern, Donovan P., 4,051,066, Cl. 252-389.00R.

Stewart, John A.: *See—*
Batzer, Othmer F.; and Stewart, John A., 4,051,027, Cl. 210-42.00R.

Still, Carl Otto; and Aust, Walter Dean, to Carl Still, Firma. Housing construction extending over the coke discharge area of a horizontal coke oven battery. 4,050,992, Cl. 202-227.000.

Stinebiser, Karl W.: *See—*
Yant, Howard W.; Stinebiser, Karl W.; and Anzur, Gregory C., 4,050,985, Cl. 176-61.000.

Stitt, Thomas Deltor: *See—*
Brinner, Thomas Richard; and Stitt, Thomas Deltor, 4,051,421, Cl. 318-367.000.

Stohr, Manfred: *See—*
Kleeberg, Ulrich; Leimkuhler, Jurgen; Knospe, Jurgen; and Stohr, Manfred, 4,050,871, Cl. 425-317.000.

Stolle Corporation, The: *See—*
Beck, Edward G., Jr., 4,050,200, Cl. 52-19.000.

Stoller, Hansjorg; and Wagner, Hans Peter, to Hoffmann-La Roche Inc. Isomerization process. 4,051,174, Cl. 560-234.000.

Stolz, Hermann, to MATO Maschinen- und Metallwarenfabrik Curt Matthaei GmbH & Co. KG. Apparatus for attaching connectors to the ends of a conveyor belt. 4,050,138, Cl. 29-243.510.

Stone, Clement A., to Merck & Co., Inc. Novel anti-hypertensive compositions. 4,051,251, Cl. 424-273.00R.

Stone, Thomas, to Silver, Jules. Dispensing container. 4,050,612, Cl. 222-135.000.

Storace, Anthony, to Pitney-Bowes, Inc. Method and apparatus for determining weight and mass. 4,050,530, Cl. 177-1.000.

Storch, Leonard; and Thomas, George H., to Leonard Storch Enterprises, Inc. Film font for photocomposing apparatus. 4,051,487, Cl. 354-12.000.

Storck, Glenn E.; and Kominiak, Andrew A., to Amerace Corporation. Methods and apparatus for electrical contact assembly. 4,050,149, Cl. 29-630.00R.

Strashinsky, Vadim Konstantinovich: *See—*
Lavrentiev, Konstantin Nikitich; Borisova, Natalya Isaakievna; Vasiliev, Jury Ivanovich; Rodionov, Jury Nikolaevich; Strashinsky, Vadim Konstantinovich; Ioffe, Vladimir Fedorovich; and Vyatskin, Iosif Yakovlevich, deceased, 4,051,422, Cl. 318-570.000.

Stratton, Donald W.; and Moorhead, John P., to Anderson Company, The. Windshield wiper pivot arm connection. 4,050,832, Cl. 403-321.000.

Streicher, Heinz, to General Electric Company. Electric multiple flash arrangement. 4,051,359, Cl. 362-4.000.

Streit, Kenneth F., to Phone-Ducs, Inc. Reinforced plastic pipe. 4,050,721, Cl. 285-93.000.

Strinning, Olof Bo Sven, to Mjolkcentralen, Ekonomisk Forening. Low calorie, high protein tablespreads from sweet milk and their production. 4,051,269, Cl. 426-603.000.

Strom, John A.: *See—*
Mack, Richard B.; Strom, John A.; and Martinez, Anthony, 4,051,474, Cl. 343-100.0LE.

Strong, William James; and Palmer, Edward Paul, to Brigham Young University. Speech coding hearing aid system utilizing formant frequency transformation. 4,051,331, Cl. 179-107.00R.

Stroszynski, Joachim, to Hoechst Aktiengesellschaft. Apparatus for the manufacture of a series of photoconductor webs. 4,050,410, Cl. 118-410.000.

Strother, Charles W., to UOP Inc. Fluid catalytic cracking process for upgrading a gasoline-range feed. 4,051,013, Cl. 208-78.000.

Stubbings, James H., to Potomac Applied Mechanics, Inc. Insulation cutter. 4,050,336, Cl. 83-486.100.

Stubbings, James Henry, to Potomac Applied Mechanics, Inc. Continuous welder. 4,051,342, Cl. 219-60.00A.

Stubbs, Joseph E.: *See—*
Fuller, Harold L., Jr.; and Stubbs, Joseph E., 4,050,435, Cl. 123-198.00F.

Sturm, Helmut, to Frank L. Wells Company. Coil spring feeding apparatus. 4,050,610, Cl. 221-171.000.

Suchy, Milos: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 4,051,319, Cl. 542-413.000.

Suda, Masashi: *See—*
Ito, Yoshio; Ariga, Masao; and Suda, Masashi, 4,050,691, Cl. 271-124.000.

Sugita, Mitsuyuki: *See—*
Ikeno, Hitoshi; Sugita, Mitsuyuki; and Yanagi, Hirofumi, 4,050,126, Cl. 29-25.350.

Sumitomo Chemical Company, Limited: *See—*
Shiga, Shujiro; Katsumata, Takeshi; Okamoto, Yasushi; and Hikasa, Tadashi, 4,051,225, Cl. 423-235.000.

Sumitomo Durez Company, Ltd.: *See—*
Takemura, Takeshi; Katoh, Yoshihisa; Kurita, Shigeyuki; Sasaki, Susumu; Funabiki, Kyohei; and Hatano, Keizo, 4,051,098, Cl. 260-38.000.

Sumitomo Electric Industries, Ltd.: *See—*
Motoyoshi, Kenya; Kume, Masahiro; and Amano, Yoshinari, 4,050,930, Cl. 75-173.00A.

Summers, Jack C.: *See—*
Hegedus, Louis; and Summers, Jack C., 4,051,073, Cl. 252-466.0PT.

Sunamori, Takashi; and Obana, Sachio, to Mitsubishi Rayon Co., Ltd. Electrodeposition coating method using alternating current. 4,051,004, Cl. 204-181.000.

Sureau, Robert Frederic Michel: *See—*
Dupre, Victor Marie; Pechmeze, Jacques Pierre Edmond; and Sureau, Robert Frederic Michel, 4,051,145, Cl. 548-372.000.

Sutton Engineering Company: *See—*
Sibler, Guenter W., 4,050,281, Cl. 72-265.000.

Suzuki, Eiji, to Taisei Kogyo Co., Ltd. Filter apparatus. 4,051,031, Cl. 210-133.000.

Suzuki, Ikuo; and Nishiyama, Shuji, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Music box toy. 4,050,342, Cl. 84-95.00C.

Suzuki, Isamu: *See—*
Sakai, Toshimitsu; Saitou, Tadashi; and Suzuki, Isamu, 4,050,861, Cl. 417-471.000.

Suzuki, Kazuo: *See—*
Kataoka, Hiroyuki; Yahiro, Seinosuke; and Suzuki, Kazuo, 4,050,547, Cl. 187-29.00R.

Suzuki, Masane, to Fuji Photo Optical Co., Ltd. System for measuring and recording three dimensional configuration of object. 4,051,483, Cl. 346-33.00A.

Suzuki, Nobuyuki; and Nishihara, Toyotaro, to Hitachi, Ltd. High-voltage circuit for post focusing type color picture tube. 4,051,514, Cl. 358-65.000.

Suzuki, Sukenori: *See—*
Fujita, Masanori; and Suzuki, Sukenori, 4,050,787, Cl. 350-160.0LC.

Suzuki, Takashi; and Naito, Susumu, to Mitsubishi Gas Chemical Company, Inc. Process for preparing formate esters of alkyl-substituted aromatic hydroxy compounds. 4,051,318, Cl. 560-131.000.

Suzuki, Yoshio. Heat-sensitive color-producing compositions and articles using same. 4,050,945, Cl. 106-21.000.

Suzuki, Yukio: *See—*
Seki, Kunio; Suzuki, Yukio; and Sakamoto, Yoshio, 4,051,443, Cl. 330-258.000.

Svensson, Roger Ronny Jochen: *See—*
Svensson, Ulf, 4,050,792, Cl. 350-319.000.

Svensson, Ulf, to Svensson, Roger Ronny Jochen. Observation port assembly. 4,050,792, Cl. 350-319.000.

Swallow, Douglas Lintin, to Imperial Chemical Industries Limited. Guanidine derivatives. 4,051,256, Cl. 424-304.000.

Sweeney, Patrick E., to AAI Corporation. Cutting torch arrangement. 4,050,680, Cl. 266-48.000.

Sweet, Douglas W., to General Motors Corporation. Digital frequency measuring circuitry. 4,051,434, Cl. 324-78.00D.

Swiatosz, Edmund; and Marshall, Albert H., to United States of America, Navy. Recoil simulator. 4,050,166, Cl. 35-25.000.

Swinehart, Carl F., to Harshaw Chemical Company, The. Growth of doped crystals. 4,050,905, Cl. 23-301.000.

Sybron Corporation: *See—*
Gruner, Heinz Walter, 4,051,444, Cl. 330-68.000.

Syltebo, Bjarne Elroy, to Boeing Company, The. Jet engine nozzle for controlling the direction of thrust. 4,050,631, Cl. 239-265.250.

Sylvester, John L., to Ecodyne Corporation. Fin tube distribution nozzle. 4,050,634, Cl. 239-601.000.

Syntex Corporation: *See—*
Fried, John H.; and Harrison, Ian T., 4,051,233, Cl. 424-317.000.

Syntex (U.S.A.) Inc.: *See—*
Ackrell, Jack, 4,051,149, Cl. 260-327.00B.
Kluge, Arthur F., 4,051,150, Cl. 260-327.00B.
Nelson, Peter H.; and Untch, Karl G., 4,051,260, Cl. 424-331.000.
Prince, Anthony; Halpern, Otto; and Ackrell, Jack, 4,051,148, Cl. 260-327.00B.
Segre, Eugene J., 4,051,241, Cl. 424-243.000.

Szabo, Michael V. Bicycle stand. 4,050,583, Cl. 211-20.000.

Tabler, Charles P., to Kornylak Corporation. Continuous rigid foam panel production. 4,051,209, Cl. 264-39.000.

Tack, Hans: *See—*
Jester, Willi; and Tack, Hans, 4,050,129, Cl. 407-45.000.

Tada, Akio; and Torihata, Hideyuki. Hook latching device. 4,050,730, Cl. 294-82.00R.

Tada, Seiji, to Sato Tekko Co., Ltd. Cross-roll forging machine. 4,050,273, Cl. 72-69.000.

Taddicken, Hermann, to Eisele Apparate-und Geratebau GmbH. Button selector feed for a button sewing machine. 4,050,392, Cl. 112-113.000.

Taga, Yutaka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Oil pressure control system for an automatic transmission system. 4,050,332, Cl. 74-869.000.

Taggart, George W.: *See—*
Bond, Desmond H.; Taggart, George W.; and Jaeger, Kurt S., 4,051,231, Cl. 423-659.000.

Tagirov, Kurban Magomedovich; Akopian, Nikolai Rubenovich; Konontsev, Valery Vasilievich; and Lutsenko, Jury Nikolaevich. Apparatus for treating rock surrounding a wellbore. 4,050,529, Cl. 175-422.000.

Taisei Kogyo Co., Ltd.: *See—*
Suzuki, Eiji, 4,051,031, Cl. 210-133.000.

Takahashi, Eiichi: *See—*
Ohtsuka, Shigeto; Ueno, Saburo; Yoshikumi, Chikao; Hirose, Fumio; Ohmura, Yoshio; Wada, Toshihiko; Fujii, Takayoshi; and Takahashi, Eiichi, 4,051,314, Cl. 536-1.000.

Takahashi, Juhei: *See—*
Mafune, Yasuo; and Takahashi, Juhei, 4,051,325, Cl. 179-1.0HF.

Takahashi, Shuichi, to Honda Giken Kogyo Kabushiki Kaisha. Control system of an alternating-current motor. 4,051,419, Cl. 318-227.000.

Takahashi, Toshiro; Nagano, Toshihiro; Iguchi, Shozo; Kikuchi, Masaru; Nakamura, Katsuhiko; and Mochizuki, Atsushi, to Riken Keikinzoku Kogyo Kabushiki Kaisha. Method and apparatus for manufacturing extruded structural profiles from aluminum based metal scraps. 4,050,142, Cl. 29-403.000.

Takahashi, Yasuro; Fujima, Yukihisa; Oguri, Masaharu; and Komori, Akito, to Mitsubishi Jukogyo Kabushiki Kaisha. Fuel combustion apparatus. 4,050,879, Cl. 431-174.000.

Takahashi, Yukio: *See—*
Shimada, Satoshi; Yamada, Kazuji; Matsuda, Yasumasa; Kimura, Ichiro; Shimazoe, Michitaka; and Takahashi, Yukio, 4,050,313, Cl. 73-398.0AR.

Takai, Teruo: *See—*
Seno, Shougo; Toyama, Tatsuro; Takai, Teruo; and Ueda, Yasuomi, 4,051,550, Cl. 361-402.000.

Takaishi, Toshio: *See—*
Sato, Yasuhiro; Sato, Toshio; Kawasaki, Shuichi; Takaishi, Toshio; Okuyama, Sadao; and Yamanashi, Norio, 4,050,371, Cl. 99-550.000.

Takeda, Keiji; Murata, Masataka; and Ikeda, Teppei, to Fuji Photo Film Co., Ltd. Image forming process with photopolymer layers between a support and a substrate. 4,050,936, Cl. 96-28.000.

Takeda, Yasutsugu; Nakamura, Hisashi; Tsunoda, Yoshito; Tsukada, Toshihisa; and Miyauchi, Toshimitsu, to Hitachi, Ltd. Apparatus for optically reconstructing information. 4,051,528, Cl. 358-128.000.

Takematsu, Tetsuo; Konnai, Makoto; Isogawa, Takayuki; and Kodama, Koshiro, to Hodogaya Chemical Co., Ltd. Herbicidal composition for paddy field use. 4,050,920, Cl. 71-88.000.

Takemura, Takeshi; Katoh, Yoshihisa; Kurita, Shigeyuki; Sasaki, Susumu; Funabiki, Kyohei; and Hatano, Keizo, to Sumitomo Durez Company, Ltd.; and Daiichi Tanso Kogyo KK. Method of preparing shaped active carbon. 4,051,098, Cl. 260-38.000.

Takeshita, Isao, to Japan Atomic Energy Research Institute. Method for inspecting nuclear fuel rod or irradiation capsule. 4,051,369, Cl. 250-321.000.

Takeuchi, Kouichi; Itoh, Norio; Koyama, Kuniyoshi; Shimada, Satoshi; and Himuro, Masami, to Sony Corporation. Color image projecting apparatus. 4,051,513, Cl. 358-60.000.

Takeuchi, Makoto: *See—*
Imanari, Mamoru; Takeuchi, Makoto; Shimizu, Shozo; and Higuchi, Hisashi, 4,051,429, Cl. 324-.50A.

Takewell, Robert B.; Brandon, Paul W.; and Odom, Paul R., to J. M. Huber Corporation. Apparatus for agglomerating powders. 4,050,869, Cl. 425-222.000.

Takeyasu, Kiyoo: *See—*
Fujinawa, Masaaki; Takeyasu, Kiyoo; Iizuka, Kenichi; Uchida, Motokazu; and Uzuhashi, Hideo, 4,051,417, Cl. 318-138.000.

Tanaka, Hiroshi, to K.K. Tokai Rika Denki Seisakusho. Lock assembly. 4,050,272, Cl. 70-100.000.

Tanaka, Junzo; and Kai, Toshio, to Matsushita Electric Industrial Co., Ltd. Microwave oven door screen. 4,051,341, Cl. 219-10.55D.

Tanaka, Keiji; Ando, Yujiro; and Ohara, Katsunobu, to Canon Kabu-

shiki Kaisha. Electrophotographic copying machine. 4,050,802, Cl. 355-3.00R.
Tanaka, Mikio, to Makoto Takugyo Kabushikikaisha. Refrigerating container. 4,050,264, Cl. 62-457.000.
Tanaka, Satoru; and Watanabe, Hideaki, to Eisai Co., Ltd. 1,3-Benzodioxol derivatives. 4,051,125, Cl. 260-239.0BC.
Tanaka, Susumu: *See*—
Morikawa, Nobutaka; and Tanaka, Susumu, 4,050,244, Cl. 60-282.000.
Tanaka, Yukiyasu: *See*—
Noguchi, Masaaki; Tanaka, Yukiyasu; Sekiya, Setsuro; and Motosugi, Katsuhiko, 4,050,422, Cl. 123-75.00B.
Tangye Limited: *See*—
Robbins, Joseph Henry, deceased; and Acton, John Edward, 4,050,674, Cl. 254-93.00H.
Tanikoshi, Kinji, to Canon Kabushiki Kaisha; and Canon Seiki Kabushiki Kaisha. Hall motor control system. 4,051,420, Cl. 318-254.000.
Tanner, Lee Elliot; Ray, Ranjan; and Cline, Carl F., to Allied Chemical Corporation. Amorphous metal alloys in the beryllium-titanium-zirconium system. 4,050,931, Cl. 75-175.500.
Tanoshima, Katsuhide: *See*—
Watanabe, Akinori; Tanoshima, Katsuhide; Noguchi, Matsusaburo; and Hattori, Kinya, 4,050,377, Cl. 101-114.000.
Tardy, Andre, to Compagnie Generale d'Electricite. Connector for an optical fibre link. 4,050,783, Cl. 350-96.00C.
Tarr, Walter R., to Bendix Corporation, The. Method of attaching a friction lining to a reinforcing cup. 4,050,619, Cl. 228-162.000.
Tassie, Douglas Pray, to General Electric Company. Renewable liquid investment seal. 4,050,352, Cl. 89-7.000.
Tatton, James: *See*—
Tatton, Nelson; and Tatton, James, 4,050,400, Cl. 116-26.000.
Tatton, Nelson; and Tatton, James. Marine navigation instrument. 4,050,400, Cl. 116-26.000.
Taubitz, Christof: *See*—
Wendel, Kurt; Reichel, Fritz; and Taubitz, Christof, 4,051,093, Cl. 260-29.6TA.
Taylor, Allen L., to Minnesota Mining and Manufacturing. Weight actuated piezolelectric polymeric transducer. 4,051,395, Cl. 310-329.000.
Taylor, Allen L., to Minnesota Mining and Manufacturing Company. Two sensitivity level kinetic sensor. 4,051,397, Cl. 310-351.000.
Taylor, Edgar R., Jr.: *See*—
Kilgore, Lee A.; Taylor, Edgar R., Jr.; and South, William H., 4,051,427, Cl. 322-99.000.
Taylor, George W.: *See*—
Fincke, George C.; and Taylor, George W., 4,051,449, Cl. 333-73.00C.
Taylor, Larry A.: *See*—
Williams, Joel L.; Tulis, Jerry J.; and Taylor, Larry A., 4,050,576, Cl. 206-210.000.
Taylor, Lynn J.: *See*—
Tobias, John W.; Taylor, Lynn J.; and Gaumer, Stuart J., 4,051,306, Cl. 526-1.000.
Tcherkinsky, Boris; and Wasem, Hans, to Sandoz Ltd. Azo pigments having two 2-halo-5-trifluoromethylphenyl diazo component radicals and a bis-(2-hydroxynaphthoyl-3-amino)-2,5-dihalobenzene coupling component radical. 4,051,121, Cl. 260-174.000.
Teach, Ted L., to Laserplane Corporation. Depth control for endless chain type trencher. 4,050,171, Cl. 37-86.000.
Tecalemit Limited: *See*—
Jackson, Harold Ernest, 4,050,431, Cl. 123-139.0AW.
Techne(Cambridge) Limited: *See*—
Fairbairn, Geoffrey; Cooke, George Frederick; Winkworth, Reginald; and Koreki, Jan, 4,050,289, Cl. 73-1.00F.
"Technico Development and Financing S. A."Firma: *See*—
Mehnert, Walter, 4,050,262, Cl. 62-160.000.
Teckton, Inc.: *See*—
Goltsos, Costas E., 4,051,266, Cl. 426-120.000.
Teijin Limited: *See*—
Hayashi, Kazushige; Minemura, Norihiro; Fujimoto, Iwao; Ozaki, Kiyotaka; Yoshida, Norio; Morishita, Toshio; and Shinoki, Takanori, 4,051,287, Cl. 428-91.000.
Kuratsuji, Takatoshi; Inata, Hiroo; and Kawase, Shoji, 4,051,112, Cl. 260-75.00T.
Tektronix, Inc.: *See*—
Nelson, Larry A.; and Crosby, Philip Stephen, 4,051,440, Cl. 328-134.000.
Telecommunications Radioelectriques et Telephoniques T.R.T.: *See*—
Bonnerot, Georges, 4,051,357, Cl. 364-726.000.
Telephone Utilities and Communications Industries, Inc.: *See*—
Smith, Jerry L., 4,051,425, Cl. 363-86.000.
Terracciano, Andrew. Deep fat fryer heated fat supply reservoir and fat replenishment device. 4,050,447, Cl. 126-374.000.
Terrill, David B.: *See*—
Shaw, Wilfrid G.; and Terrill, David B., 4,051,180, Cl. 260-530.00N.
Tersch, Richard W.; and Bassoff, Arthur B., to Lear Siegler, Inc. Gear finishing. 4,050,350, Cl. 90-1.60R.
Terzian, Rouben T., to Marvin Glass & Associates. Facial liquid excreting doll. 4,050,185, Cl. 46-135.00A.
Texaco Inc.: *See*—
Arnold, Dan M.; Paap, Hans J.; and Scott, Hubert D., 4,051,368, Cl. 250-270.000.
Bunn, Dorrance P., Jr.; Williams, Dale; Jones, Henry B.; and MacLean, John P., 4,051,069, Cl. 252-417.000.
Wu, Ching H.; Brown, Alfred; Huang, Wann-Sheng; and Shum, Yick-Mow, 4,050,513, Cl. 166-274.000.
Texas Instruments Incorporated: *See*—
Choate, William Clay, 4,051,354, Cl. 235-312.000.
Orstein, Jacob L.; and Thomas, Seth R., 4,050,906, Cl. 428-617.000.
Smeltzer, Ronald K.; and Bean, Kenneth E., 4,050,979, Cl. 156-647.000.
Teyssandier, Gaston. Transmission gear mechanism. 4,050,324, Cl. 74-397.000.
Thekdi, Arvind C.: *See*—
Hemsath, Klaus H.; and Thekdi, Arvind C., 4,050,912, Cl. 55-223.000.
Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industrie-gesellschaft m.b.H. Rail grinding machine. 4,050,196, Cl. 51-178.000.
Theysohn, Helmuth. Calender heating roll. 4,050,510, Cl. 165-89.000.
Thomas, Alan, to Lucas Industries Limited. Apparatus for measuring mass flow of fluids. 4,050,304, Cl. 73-194.00B.
Thomas & Betts Corporation: *See*—
Churla, John J., 4,051,323, Cl. 174-78.000.
Thomas, George H.: *See*—
Storch, Leonard; and Thomas, George H., 4,051,487, Cl. 354-12.000.
Thomas, Herbert: *See*—
Seubert, Jurgen; Pohlke, Rolf; Thomas, Herbert; and Andrews, Peter, 4,051,243, Cl. 424-250.000.
Thomas J. Dillon & Co., Inc.: *See*—
Dillon, Thomas J., 4,050,213, Cl. 52-743.000.
Thomas J. Lipton, Inc.: *See*—
Sanderson, Gary Warner; Hoefler, Andrew Charles; Graham, Harold Nathaniel; and Coggon, Philip, 4,051,264, Cl. 426-52.000.
Thomas, Richard E.; Florence, Robert T.; Dalal, Rustom H.; and Scheuer, Raymond I., to A. B. Dick Company. Printed sheets containing concealed images and method and materials for preparation and visual development of same. 4,051,283, Cl. 428-29.000.
Thomas, Robert J.; and Jones, Marvin H., to Samuel Moore and Company. Fast-make connection for a push-pull control cable assembly. 4,050,327, Cl. 74-502.000.
Thomas, Seth R.: *See*—
Orstein, Jacob L.; and Thomas, Seth R., 4,050,906, Cl. 428-617.000.
Thompson, Nelson L., administrator: *See*—
Thompson, Willis F., deceased; and Thompson, Nelson L., administrator, 4,050,197, Cl. 51-208.000.
Thompson, Ronald: *See*—
Andrew, Herbert Francis; Stead, Cecil Vivian; and Thompson, Ronald, 4,051,175, Cl. 260-502.500.
Thompson, Willis F., deceased; and by Thompson, Nelson L., administrator. Blade and scissors sharpener. 4,050,197, Cl. 51-208.000.
Thomson-Brandt: *See*—
Blondet, Bruno; Kretschmer, Sylvain; Lacotte, Jean Pierre; and Peltier, Jean Paul, 4,051,329, Cl. 179-100.30N.
Thomson-CSF: *See*—
Coussot, Gerard, 4,051,448, Cl. 333-30.00R.
Trotel, Jacques, 4,051,381, Cl. 250-492.00A.
Thresher Institutes Incorporated: *See*—
Rudy, Christopher John, 4,050,439, Cl. 124-20.00R.
Tidd, James Alfred, to Alphatype Corporation. Phototypesetting machine. 4,051,488, Cl. 354-13.000.
Tieden, Jansey D., to Boeing Company, The. Zero crossing AC relay control circuit. 4,051,394, Cl. 307-310.000.
Tiemann, Reinhard: *See*—
Pakur, Henryk; and Tiemann, Reinhard, 4,050,497, Cl. 152-361.0FP.
Tinnefeld, Bernd: *See*—
Bowing, Walter Grosse; Mrozek, Hinrich; Schlussler, Hans-Joachim; Tinnefeld, Bernd; and Vogele, Peter, 4,051,058, Cl. 252-186.000.
Bowing, Walter Grosse; Mrozek, Hinrich; Schlussler, Hans-Joachim; Tinnefeld, Bernd; and Vogele, Peter, 4,051,059, Cl. 252-186.000.
Tisma, Stevan, to John O. Butler Company. Thread storage and dispensing system. 4,050,648, Cl. 242-129.800.
TMC Corporation: *See*—
Kubelka, Axel; and Schweizer, Gottfried, 4,050,716, Cl. 280-614.000.
Tobias, John W.; Taylor, Lynn J.; and Gaumer, Stuart J., to Owens-Illinois, Inc. Controlled environmental deterioration of plastics. 4,051,306, Cl. 526-1.000.
Tobias, Michael A.; and Martinez, Carlos J., to Mobil Oil Corporation. Water reducible short oil alkyd resins and process of making same. 4,051,089, Cl. 260-22.00R.
Tokai Rika Denki Seisakusho K.K.: *See*—
Yamada, Makoto; Sasaki, Shiro; Kanazawa, Shigenori; and Hayashi, Yoshihiro, 4,050,717, Cl. 280-744.000.
Tokashiki, Kanenobu, to Lucas Industries Limited. Liquid fuel pumping apparatus. 4,050,433, Cl. 123-139.0AQ.
Tokyo Shibaura Electric Co., Ltd.: *See*—
Ogawa, Kazuyuki; Hirose, Masahiko; Yada, Masaaki; and Imamura, Hitoshi, 4,051,382, Cl. 250-531.000.
Tom, Elgin Megginson; and Vogelpohl, Roland L., to Owens-Illinois, Inc. Color television tube structure and method of manufacture. 4,050,602, Cl. 220-2.10A.
Tomita, Koji: *See*—
Kawaguchi, Hiroshi; Tomita, Koji; Tsukiura, Hiroshi; and Konishi, Masataka, 4,051,237, Cl. 424-117.000.

Tommasini, Raffaele: *See*—
Ambrogi, Vittorio; Logemann, Willy; Parenti, Marc'Antonio; and Tommasini, Raffaele, 4,051,245, Cl. 424-250.000.
Tomy Kogyo Co., Inc.: *See*—
Watanabe, Ietatsu, 4,050,183, Cl. 46-4.000.
Torihata, Hideyuki: *See*—
Tada, Akio; and Torihata, Hideyuki, 4,050,730, Cl. 294-82.00R.
Torres, Jean: *See*—
Chenevard, Alexis; and Torres, Jean, 4,050,574, Cl. 198-458.000.
Torstenfelt, N. A. Ragnar, to Stal-Laval Turbin AB. Fluid pressure actuated clutch for starting multi-stage turbine. 4,050,560, Cl. 192-85.0AT.
Toshiba Kikai Kabushiki Kaisha: *See*—
Hayahusa, Nobuyuki; and Uno, Hiroaki, 4,050,229, Cl. 57-77.400.
Toshio, Mori, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece hand-return mechanism. 4,050,234, Cl. 58-85.500.
Toter-Tee, Inc.: *See*—
Glumac, Nick P., 4,050,707, Cl. 280-43.230.
Touchton, James J.; Cuda, John; and Sordello, Frank J., to Sperry Rand Corporation. Servo system with feedback signal compensation. 4,051,423, Cl. 318-611.000.
Tower Technology, Inc.: *See*—
Johnson, Roy W. P., 4,050,214, Cl. 52-745.000.
Towle, Gordon Anson, to Hercules Incorporated. Xanthan recovery process. 4,051,317, Cl. 536-114.000.
Toyama, Tatsuro: *See*—
Seno, Shougo; Toyama, Tatsuro; Takai, Teruo; and Ueda, Yasuomi, 4,051,550, Cl. 361-402.000.
Toyo Boseki Kabushiki Kaisha: *See*—
Anahara, Meiji; and Fujita, Takayoshi, 4,050,225, Cl. 57-34.0HS.
Toyo Rope Manufacturing Co., Ltd.: *See*—
Senoo, Tadao; and Honda, Kenji, 4,050,230, Cl. 57-149.000.
Toyo Seikan Kaisha Ltd.: *See*—
Sato, Yasuhiro; Sato, Toshio; Kawasaki, Shuichi; Takaishi, Toshio; Okuyama, Sadao; and Yamanashi, Norio, 4,050,371, Cl. 99-550.000.
Toyoda, Kenichi: *See*—
Shichida, Hiromichi; Katsube, Hideo; Oyama, Shigeaki; Toyoda, Kenichi; and Saito, Mitsuo, 4,050,837, Cl. 408-35.000.
Toyoda, Kenji, to Nippon Kogaku K.K. Indicating exposure meter for a camera. 4,051,491, Cl. 354-60.00L.
Toyoda Koki Kabushiki Kaisha: *See*—
Doi, Yoshio, 4,050,274, Cl. 72-82.000.
Toyooka, Terumasa. Unloading apparatus of truck. 4,050,739, Cl. 298-19.00V.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Inada, Masami; Kawabata, Yasuhiro; Sato, Katsujiro; and Osanai, Akinori, 4,050,423, Cl. 123-117.00A.
Morikawa, Nobutaka; and Tanaka, Susumu, 4,050,244, Cl. 60-282.000.
Nogami, Tomoyuki, 4,050,744, Cl. 303-24.00A.
Noguchi, Masaaki; Tanaka, Yukiyasu; Sekiya, Setsuro; and Motosugi, Katsuhiko, 4,050,422, Cl. 123-75.00B.
Sakai, Toshimitsu; Saitou, Tadashi; and Suzuki, Isamu, 4,050,861, Cl. 417-471.000.
Sakamaki, Hiroshi; and Maeda, Toshiyuki, 4,050,855, Cl. 418-131.000.
Shishido, Yoshio, 4,050,325, Cl. 74-473.00R.
Taga, Yutaka, 4,050,332, Cl. 74-869.000.
Yamada, Makoto; Sasaki, Shiro; Kanazawa, Shigenori; and Hayashi, Yoshihiro, 4,050,717, Cl. 280-744.000.
Yasuhiro, Ikuta; and Hitomi, Shimo, 4,050,429, Cl. 123-119.00A.
Traeger, Robert S.: *See*—
Knochel, Wayne L.; and Traeger, Robert S., 4,050,414, Cl. 119-1.000.
Trainer, Donald J.: *See*—
Malott, Richard C.; and Trainer, Donald J., 4,050,277, Cl. 72-129.000.
Traise, John E., to Moore Business Forms, Inc. Plow folding and heat sealer apparatus for continuous business forms. 4,050,361, Cl. 93-1.00F.
Transparent Conductors, Inc.: *See*—
Feldman, Bernard, 4,050,786, Cl. 350-160.0LC.
Treibacher Chemische Werke Aktiengesellschaft: *See*—
Hafner, Leo, 4,051,219, Cl. 423-21.000.
Trias, John A.: *See*—
Hammond, Peter R.; Schimitschek, Erhard J.; and Trias, John A., 4,051,062, Cl. 252-301.170.
Trinh, Toan; and Yeazell, Bruce Albert, to Procter & Gamble Company, The. Cleansing compositions. 4,051,055, Cl. 252-95.000.
Troncoso, Fernando, Jr. Archery arrow. 4,050,696, Cl. 273-106.50B.
Trost, Barry M.; and Verhoeven, Thomas R., to Wisconsin Alumni Research Foundation. Catalytic allylic alkylation. 4,051,157, Cl. 260-397.100.
Trotel, Jacques, to Thomson-CSF. Device for the programmed tracing of designs by particle bombardment. 4,051,381, Cl. 250-492.00A.
Trott, Arthur F.: *See*—
Foltz, Carl L.; Troutner, Vernon H.; and Trott, Arthur F., 4,050,528, Cl. 173-163.000.
Troutner, Vernon H.: *See*—
Foltz, Carl L.; Troutner, Vernon H.; and Trott, Arthur F., 4,050,528, Cl. 173-163.000.
TRW Inc.: *See*—
Altshuler, Saul, 4,051,479, Cl. 343-703.000.
Cohen, Lawrence S., 4,050,760, Cl. 339-97.00R.
Tschopp, Paul: *See*—
Piller, Bernhard; Lenoir, John; Froehlich, Alfred; Stauner, Thomas; and Tschopp, Paul, 4,051,123, Cl. 260-178.000.
TSN Company, Inc.: *See*—
Woodrow, Arthur F.; and Simmons, Jorge E., 4,050,824, Cl. 356-197.000.
Tsoucalas, Michael; Barclay, Kenneth W.; and Rogers, Jack M., to Avon Products, Inc. Transparent fragrance releasing composition and method of making same. 4,051,159, Cl. 260-404.500.
Tsuchihashi, Genichi; and Ogura, Katsuyuki, to Sagami Chemical Research Center. Thiophene derivatives and process for preparation thereof. 4,051,151, Cl. 260-329.00S.
Tsuchimochi, Yoshihisa: *See*—
Mabuchi, Kenichi; and Tsuchimochi, Yoshihisa, 4,050,487, Cl. 144-28.500.
Tsukada, Toshihisa: *See*—
Takeda, Yasutsugu; Nakamura, Hisashi; Tsunoda, Yoshito; Tsukada, Toshihisa; and Miyauchi, Toshimitsu, 4,051,528, Cl. 358-128.000.
Tsukamoto, Masaaki: *See*—
Nakagawa, Sadao; Tsukamoto, Masaaki; and Dobashi, Toshio, 4,051,493, Cl. 354-126.000.
Tsukiura, Hiroshi: *See*—
Kawaguchi, Hiroshi; Tomita, Koji; Tsukiura, Hiroshi; and Konishi, Masataka, 4,051,237, Cl. 424-117.000.
Tsunemitsu, Hideo: *See*—
Sato, Susumu; and Tsunemitsu, Hideo, 4,051,508, Cl. 357-71.000.
Tsunoda, Yoshito: *See*—
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Tsuruta, Motohiro; Kimura, Hiroshiro; Koshimo, Akio; Nara, Hirohisa; Goto, Tokuju; and Amemiya, Kunio, to Unitika Kabushiki Kaisha. Process for imparting elasticity to woven textile fabrics. 4,051,215, Cl. 264-137.000.
Tucker, Benjamin W.: *See*—
Richter, Reinhard H.; Tucker, Benjamin W.; and Ulrich, Henri, 4,051,166, Cl. 260-453.0AR.
Tulis, Jerry J.: *See*—
Williams, Joel L.; Tulis, Jerry J.; and Taylor, Larry A., 4,050,576, Cl. 206-210.000.
Tull, Roger J.: *See*—
Weinstock, Leonard M.; Tull, Roger J.; and Mulvey, Dennis M., 4,051,144, Cl. 260-307.0FA.
Tullier, Leo D.; and Vignone, John F. Fluid flow filtering arrangement. 4,051,042, Cl. 210-409.000.
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Gyori, Robert Paul; and Tullio, Thomas, 4,050,808, Cl. 355-38.000.
Turner, James Wesley, deceased (by Heim, Thomas M., executor); and Spinks, Ray E., to United States of America, Navy. Side-mounted automatic power release attachment for manual connectors. 4,050,122, Cl. 24-230.00A.
Turner, John Cameron; and Chan, Rosalind Po-Kuen, to Biorex Laboratories Limited. Derivatives of 1,2-diphenyl-ethane. 4,051,263, Cl. 424-347.000.
Turner, John W.; and McLaughlin, Russell A., to Joy Manufacturing Company. Torque indicating assembly. 4,050,300, Cl. 73-139.000.
Turner, Sam R., to Xerox Corporation. Electron acceptor monomers and polymers. 4,050,934, Cl. 96-1.00R.
Tuvesson, Par-Ake; and Johansson, Carl-Gustaf, to Lindab, Lindhs Industri AB. Tubular connectors. 4,050,703, Cl. 277-207.00A.
U-S Safety Trolley Corporation: *See*—
Ross, Donald R., Jr., 4,050,555, Cl. 191-23.00A.
U. Scharer Sohne AG, (USM): *See*—
Scherrer, Kurt, 4,050,753, Cl. 312-257.0SK.
Uba, Toshio: *See*—
Ching, Larry K. W.; Coleman, Charles E.; and Uba, Toshio, 4,050,482, Cl. 141-1.100.
Ube Industries, Ltd.: *See*—
Asano, Toyohide; and Honda, Masahiro, 4,050,278, Cl. 72-257.000.
Ube Nitto Kasei Co., Ltd.: *See*—
Senoo, Tadao; and Honda, Kenji, 4,050,230, Cl. 57-149.000.
Uchida, Motokazu: *See*—
Fujinawa, Masaaki; Takeyasu, Kiyoo; Iizuka, Kenichi; Uchida, Motokazu; and Uzuhashi, Hideo, 4,051,417, Cl. 318-138.000.
Uchida, Teiji; and Ueki, Atsufumi, to Nippon Electric Company, Ltd. Mode separator and delay equalizer for multimode optical fiber transmission systems. 4,050,782, Cl. 350-96.00C.
Uchimura, Mitsuo: *See*—
Nakamura, Yasushi; Itou, Michihisa; and Uchimura, Mitsuo, 4,050,960, Cl. 148-16.000.
Udipi, Kishore; and Hsieh, Henry L., to Phillips Petroleum Company. Epoxidized copolymers of styrene, butadiene and isoprene. 4,051,199, Cl. 260-880.00R.
Ueda, Yasuo; Kamezawa, Yasutoki; Aizawa, Tatsuo; and Ikeda, Toshimitu, to Mita Industrial Company Ltd. Liquid developer. 4,051,052, Cl. 252-62.10L.
Ueda, Yasuomi: *See*—
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Ueki, Atsufumi: *See*—
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Ueno, Saburo: *See*—
Ohtsuka, Shigeto; Ueno, Saburo; Yoshikumi, Chikao; Hirose, Fumio; Ohmura, Yoshio; Wada, Toshihiko; Fujii, Takayoshi; and Takahashi, Eiichi, 4,051,314, Cl. 536-1.000.

Uitti, Kenneth D.: *See*—
Bunas, Bennie I.; and Uitti, Kenneth D., 4,051,206, Cl. 261-109.000.
Ulrich, Henri: *See*—
Richter, Reinhard H.; Tucker, Benjamin W.; and Ulrich, Henri, 4,051,166, Cl. 260-453.0AR.
Underwood, John F. Electromagnetic pickup for stringed musical instruments. 4,050,341, Cl. 84-1.150.
Union Carbide Corporation: *See*—
Melby, Earl George, 4,051,079, Cl. 260-2.20R.
Union Fork & Hoe Company, The: *See*—
Bonnes, David R., 4,050,727, Cl. 294-49.000.
Union Insulating Company: *See*—
Harris, Robert M.; Mills, Gene F.; and Shaffer, David T., 4,050,603, Cl. 220-3.900.
Uniroyal Inc.: *See*—
Neville, James J.; Ferrell, Wesley; and Schichman, Daniel, 4,050,973, Cl. 156-123.00R.
Plant, Howard L.; Zukel, John W.; and Ames, Ronald B., 4,050,921, Cl. 71-94.000.
United Kingdom Atomic Energy Authority: *See*—
Nelson, Richard Stuart; Pugh, Stanley Frederick; and Smith, Michael John Stapley, 4,051,063, Cl. 252-301.10W.
United States Gypsum Company: *See*—
Long, William J., 4,051,291, Cl. 428-201.000.
United States of America
Agriculture: *See*—
Wing, Robert E.; and Doane, William M., 4,051,316, Cl. 536-107.000.
Air Force: *See*—
Helminiak, Thaddeus E.; and Arnold, Fred E., 4,051,108, Cl. 260-47.0CP.
Ipri, Alfred C.; and Sarace, John C., 4,050,965, Cl. 148-175.000.
Mack, Richard B.; Strom, John A.; and Martinez, Anthony, 4,051,474, Cl. 343-100.0LE.
Oberth, Adolf E., 4,050,969, Cl. 149-19.400.
Peterson, Paul F., 4,050,656, Cl. 244-137.00R.
Sharpe, William N., Jr.; and Hollenberg, Glenn W., 4,050,818, Cl. 356-32.000.
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Adelman, Stanley M.; Ellington, Donal G.; and Quatrochi, Philip J., 4,050,347, Cl. 86-20.00R.
Bly, Vincent T., 4,051,370, Cl. 250-331.000.
Brody, Philip S., 4,051,465, Cl. 340-173.200.
Campbell, Donn V., 4,051,475, Cl. 343-180.000.
de Claire, Robert B., 4,050,494, Cl. 151-49.000.
Feingold, Robert M.; Hoover, Carl W., Jr.; and Rennie, John, 4,051,403, Cl. 313-105.0CM.
Fincke, George C.; and Taylor, George W., 4,051,449, Cl. 333-73.00C.
Heinemann, Robert W., 4,050,381, Cl. 102-4.000.
Lee, John N.; and Oswald, Robert B., Jr., 4,051,405, Cl. 313-361.000.
McMullen, Willard C.; Gee, Samuel, Sr., deceased; Whitney, Patricia E., legal representative; and Beannett, Joan E., legal representative, 4,050,307, Cl. 73-337.000.
Reggia, Frank; and Jones, Howard S., Jr., 4,051,480, Cl. 343-705.000.
Congress: *See*—
Williams, John C.; and Kelly, George B., Jr., 4,051,276, Cl. 427-248.00C.
Energy Research and Development Administration: *See*—
Arnold, Wesley D., Jr., 4,051,202, Cl. 260-990.000.
Ference, Edward W.; Houtman, John L.; and Waldby, Robert N., 4,050,986, Cl. 176-61.000.
Schulz, Wallace W., 4,051,203, Cl. 260-990.000.
Health, Education and Welfare: *See*—
Ito, Yoichiro, 4,051,025, Cl. 210-31.00C.
Navy: *See*—
Drennen, Thomas G.; and Neander, Allen, 4,050,265, Cl. 64-11.00R.
Fish, Franklin H., 4,051,363, Cl. 250-199.000.
Giles, Michael K.; and Iverson, Myren L., 4,051,364, Cl. 250-199.000.
Goldhagen, Samuel; Heller, Harry; and Rothenstein, Julius, 4,050,968, Cl. 149-19.400.
Hammond, Peter R.; Schimitschek, Erhard J.; and Trias, John A., 4,051,062, Cl. 252-301.170.
Holzman, Allen L.; and Corcoran, William J., 4,050,243, Cl. 60-245.000.
Kaloi, Cyril M., 4,051,478, Cl. 343-700.0MS.
Lichtman, Samuel W., 4,050,819, Cl. 356-51.000.
Lile, Derek L.; and Davis, Neil M., 4,051,437, Cl. 324-158.00R.
Mongillo, Adolph V., 4,050,675, Cl. 254-104.000.
Nyswander, Reuben E., 4,051,439, Cl. 325-121.000.
Privee, James A., 4,051,424, Cl. 320-48.000.
Reeves, Charlie F., 4,051,390, Cl. 307-293.000.
Scholten, James R., 4,050,775, Cl. 350-200.000.
Swiatosz, Edmund; and Marshall, Albert H., 4,050,166, Cl. 35-25.000.
Turner, James Wesley, deceased; and Spinks, Ray E., 4,050,122, Cl. 24-230.00A.
Will, Albert S.; Wilson, Robert R.; and Culver, Paul L., 4,051,339, Cl. 200-153.00L.
Will, Albert S.; Wilson, Robert R.; and Black, Samuel J., 4,051,414, Cl. 361-415.000.
Veterens Affairs: *See*—
Seamone, Woodrow, 4,050,533, Cl. 180-6.500.
U.S. Philips Corporation: *See*—
Bogaard, Johan J. H.; and Korteling, Gerrit-Jan, 4,050,601, Cl. 220-2.10A.
Braat, Josephus Johannes Maria, 4,051,527, Cl. 358-128.000.
Davidse, Jan; and Koppe, Rudolf P., 4,051,520, Cl. 358-22.000.
de Boer, Jan; and Reinink, Jan, 4,050,151, Cl. 30-34.100.
Kemner, Rudolf; and Zonneveld, Frans Wessel, 4,051,377, Cl. 250-401.000.
Meier, Otto, 4,050,199, Cl. 51-285.000.
Schmedemann, Walter; and Hecker, Wolfgang, 4,050,551, Cl. 188-181.00C.
Steinkopf, Wolfgang Otto Gotthard; and Drabek, Rudolf, 4,051,526, Cl. 358-127.000.
van der Werf, Jan Evert; Heuvelmans, Jean Johan; and van Tongeren, Hendricus Franciscus Johannes Jacobus, 4,051,407, Cl. 315-106.000.
van Roosmalen, Johannes Hendrikus Theodorus; and Zuidhof, Pieter, 4,051,512, Cl. 358-51.000.
United Technologies Corporation: *See*—
Benedict, Richard S., 4,050,296, Cl. 73-116.000.
Gordon, Jason Morse, 4,051,366, Cl. 250-223.00B.
Krascella, Nicholas Leo, 4,051,005, Cl. 204-157.10R.
Miller, Guy W.; and Norris, James R., 4,050,844, Cl. 415-147.000.
Pettingell, James R.; and Armstrong, Lee R., 4,050,297, Cl. 73-117.200.
Unitika Kabushiki Kaisha: *See*—
Tsuruta, Motohiro; Kimura, Hiroshiro; Koshimo, Akio; Nara, Hirohisa; Goto, Tokuju; and Amemiya, Kunio, 4,051,215, Cl. 264-137.000.
Unitron Industries Ltd.: *See*—
Cole, William A., 4,051,330, Cl. 179-107.0FD.
University of California, The Regents of the: *See*—
Kaplan, Nathan O., 4,051,186, Cl. 260-570.700.
University Patents, Inc.: *See*—
Peck, John F.; and Hodges, Carl N., 4,050,443, Cl. 126-270.000.
Uno, Hiroaki: *See*—
Hayahusa, Nobuyuki; and Uno, Hiroaki, 4,050,229, Cl. 57-77.400.
Uno, Nayuki; Shono, Tetsuji; Urano, Fumio; Kawasaki, Masahiro; and Miyata, Katsuhiko, to Asahi Kogaku Kogyo Kabushiki Kaisha. Exposure display device for a single lens reflex camera. 4,051,503, Cl. 354-289.000.
Untch, Karl G.: *See*—
Nelson, Peter H.; and Untch, Karl G., 4,051,260, Cl. 424-331.000.
UOP Inc.: *See*—
Bailey, Charles H.; and Dillon, James E., 4,050,903, Cl. 23-288.0FC.
Bunas, Bennie I.; and Uitti, Kenneth D., 4,051,206, Cl. 261-109.000.
Hayes, John C., 4,051,071, Cl. 252-439.000.
Johnson, James A., 4,051,019, Cl. 208-146.000.
Knapik, H. Peter G.; and Adams, Frank H., 4,051,018, Cl. 208-139.000.
Markfelt, Reinhold S., 4,050,315, Cl. 73-425.40R.
Neuzil, Richard W.; and Korous, Donald J., 4,051,192, Cl. 260-674.0SA.
Pulak, Richard P., 4,050,902, Cl. 23-288.00B.
Strother, Charles W., 4,051,013, Cl. 208-78.000.
Ward, Dennis J., 4,051,191, Cl. 260-671.00R.
Upjohn Company, The: *See*—
Beser, William; and Cole, Edwin R., 4,051,211, Cl. 264-51.000.
Bundy, Gordon L.; and Nelson, Norman A., 4,051,160, Cl. 260-413.000.
Richter, Reinhard H.; Tucker, Benjamin W.; and Ulrich, Henri, 4,051,166, Cl. 260-453.0AR.
Sokolowski, James H., 4,051,238, Cl. 424-181.000.
Urano, Fumio: *See*—
Uno, Nayuki; Shono, Tetsuji; Urano, Fumio; Kawasaki, Masahiro; and Miyata, Katsuhiko, 4,051,503, Cl. 354-289.000.
Urasaki, Kazuaki: *See*—
Hatano, Isao; Nagano, Akira; and Urasaki, Kazuaki, 4,051,471, Cl. 340-365.00S.
Urso, William G.: *See*—
Kwolek, John P.; Urso, William G.; and Jones, Trevor D., 4,050,620, Cl. 228-162.000.
USM Corporation: *See*—
Elliott, Richard Montgomery; and Newton, Albert Eugene, 4,050,890, Cl. 432-210.000.
Welcher, Ray E.; and Lemay, Roger E., 4,050,393, Cl. 112-121.120.
Utsuyama, Akira. Expansion jointing material for placing concrete, mortar or the like. 4,050,206, Cl. 52-396.000.
Uzuhashi, Hideo: *See*—
Fujinawa, Masaaki; Takeyasu, Kiyoo; Iizuka, Kenichi; Uchida, Motokazu; and Uzuhashi, Hideo, 4,051,417, Cl. 318-138.000.
Vacchi, Giorgio. Containing box for various products. 4,050,623, Cl. 229-23.00R.
Valentin, Guenter: *See*—
Kissel, Ernst; Neumann, Eckart; Guenther, Ernst; Valentin, Guenter; and Hoerauf, Werner, 4,051,113, Cl. 260-78.00L.
Valint, Paul L.: *See*—
Oswald, Alexis A.; and Valint, Paul L., 4,051,240, Cl. 424-225.000.
Vallere, Donald J.: *See*—
Roth, Marvin E.; and Vallere, Donald J., 4,051,010, Cl. 204-298.000.
Valo, Antti Tapani. Lopping machine for stems of trees. 4,050,485, Cl. 144-2.00Z.
Van Allen, David: *See*—
Laskin, Irving; and Van Allen, David, 4,051,492, Cl. 354-86.000.

Vanderleest, Siebold, to Boeing Company, The. Foil fence for hydrofoil craft. 4,050,397, Cl. 114-274.000.

van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, to C. van der Lely N. V. Cultivator with screening device. 4,050,520, Cl. 172-59.000.

van der Lely, Cornelis. Soil cultivating machines. 4,050,519, Cl. 172-49.000.

Vanderveen, John W., to Phillips Petroleum Company. Carbon black reactor. 4,051,135, Cl. 23-259.500.

van der Werf, Jan Evert; Heuvelmans, Jean Johan; and van Tongeren, Hendricus Franciscus Johannes Jacobus, to U.S. Philips Corporation. Arrangement including a gas and/or vapor discharge lamp. 4,051,407, Cl. 315-106.000.

van Gils, Gerard E.; and Kalafus, Edward F., to General Tire & Rubber Company, The. Composite of rubber bonded to glass fibers. 4,051,281, Cl. 427-379.000.

Van Hook, Danny Allen: *See—*
Fox, Sidney Jared; Martin, Van Clifton; and Van Hook, Danny Allen, 4,051,538, Cl. 358-296.000.

Vanlandingham, Harold W.; Boggs, Roger L.; Bullock, David A.; and Maytum, James N., to Caterpillar Tractor Co. Track bush turning tool. 4,050,141, Cl. 29-401.00R.

Van Namen, Dick J.: *See—*
Binsbergen, Frederik L.; and Van Namen, Dick J., 4,051,051, Cl. 252-59.000.

van Rijkom, Jacobus: *See—*
Kooy, Albertus Adrianus; and van Rijkom, Jacobus, 4,051,213, Cl. 264-109.000.

van Roosmalen, Johannes Hendrikus Theodorus; and Zuidhof, Pieter, to U.S. Philips Corporation. Color television camera having at least two pick-up tubes. 4,051,512, Cl. 358-51.000.

Van Sluis, Jan Adolf; Reinhart, Frans Remko; Johansen, Johan Peter; and Pedersen, Rolf, to Koninklijke Bedrijven Theodorus Niemeyer B.V.; and Andresen, Joh. H. Apparatus for orienting tobacco leaves. 4,050,467, Cl. 131-147.00A.

van Staveren, Hendricus Cornelis: *See—*
Oosterling, Pieter Adriaan; and van Staveren, Hendricus Cornelis, 4,050,224, Cl. 56-295.000.

Van Tichelt, Jake W. Mold ejector multiplier. 4,050,666, Cl. 249-68.000.

van Tongeren, Hendricus Franciscus Johannes Jacobus: *See—*
van der Werf, Jan Evert; Heuvelmans, Jean Johan; and van Tongeren, Hendricus Franciscus Johannes Jacobus, 4,051,407, Cl. 315-106.000.

van Wingerden, Aart. Seedling growing container. 4,050,188, Cl. 47-85.000.

Van Zeggeren, Wilhelm Aart: *See—*
Schwippert, Guustaaf Arthur; and Van Zeggeren, Wilhelm Aart, 4,050,562, Cl. 194-4.00E.

Varro, Stephen. Process of conversion of solid waste into workable material with predetermined characteristics and/or into fertilizers or soil improving agents. 4,050,917, Cl. 71-9.000.

Vasiliev, Jury Ivanovich: *See—*
Lavrentiev, Konstantin Nikitich; Borisova, Natalya Isaakievna; Vasiliev, Jury Ivanovich; Rodionov, Jury Nikolaevich; Strashinsky, Vadim Konstantinovich; Ioffe, Vladimir Fedorovich; and Vyatskin, Iosif Yakovlevich, deceased, 4,051,422, Cl. 318-570.000.

Vasiliu, Dan: *See—*
Duca, Mihail; Vasiliu, Dan; Demetrescu, Teodor; Cimpoias, Ion; Linca, Ion; Breazu, Stefan; Antonescu, Virgil; and Cojocaru, Iosif, 4,050,704, Cl. 280-6.00R.

Vaught, John M., to General Motors Corporation. Variable air admission device for a combustor assembly. 4,050,240, Cl. 60-39.650.

VCA Corporation: *See—*
Beres, Steve W., 4,050,860, Cl. 417-444.000.

Veb Werkzeugmaschinenkombinat "7.Oktober: *See—*
Bachmann, Lothar; and Engemann, Karl-Heinz, 4,050,353, Cl. 90-5.000.

Vecchia, Gino Dalla, to Sperotto Brevetti S.p.A. Apparatus for washing and scouring fabrics. 4,050,270, Cl. 68-158.000.

Veigel, Neil D., to Shatterproof Glass Corporation. Transparent article and method of making the same. 4,051,297, Cl. 428-336.000.

Veilleux, Florian Leo. Support for flexible bag. 4,050,492, Cl. 150-4.000.

Velsicol Chemical Corporation: *See—*
Anderson, Arnold L.; and Nulph, Robert J., 4,051,105, Cl. 260-45.95G.
Lindvay, Michael W., 4,051,101, Cl. 260-45.85R.

Venema, Gerard J., to Nalco Chemical Company. Apparatus for dissolving water soluble polymers and gums in water. 4,051,065, Cl. 252-359.00A.

Verhoeven, Thomas R.: *See—*
Trost, Barry M.; and Verhoeven, Thomas R., 4,051,157, Cl. 260-397.100.

Verkins, Wayne R.; Podvin, Richard T.; and Rist, Karl Frederick, III, to Minnesota Mining and Manufacturing Company. Device for fusing lengths of film over the open ends of cups. 4,050,971, Cl. 156-69.000.

Vernon, Lonnie W.: *See—*
Plumlee, Karl W.; and Vernon, Lonnie W., 4,051,012, Cl. 208-8.000.

Verson Allsteel Press Company: *See—*
Beneke, Jene A.; and Bozich, George J., 4,050,557, Cl. 192-4.00R.

Vibert, Edward J., to GTE Sylvania Incorporated. Fail-safe ground fault receptacle circuit. 4,051,544, Cl. 361-45.000.

Vignone, John F.: *See—*
Tullier, Leo D.; and Vignone, John F., 4,051,042, Cl. 210-409.000.

Virtue, Eugene P.; and Lech, Richard J., to International Harvester Company. Combined fixed and variable displacement pump system. 4,050,478, Cl. 137-625.660.

Vockenhuber, Karl: *See—*
Wendisch, Irmgard, 4,050,788, Cl. 350-184.000.

Vogele, Bruno Joseph: *See—*
Bogue, Robert Edgar; Jones, Donald Keith; Riggs, Ray Vere; and Vogele, Bruno Joseph, 4,050,655, Cl. 244-137.00R.

Vogele, Peter: *See—*
Bowing, Walter Grosse; Mrozek, Hinrich; Schlussler, Hans-Joachim; Tinnefeld, Bernd; and Vogele, Peter, 4,051,058, Cl. 252-186.000.
Bowing, Walter Grosse; Mrozek, Hinrich; Schlussler, Hans-Joachim; Tinnefeld, Bernd; and Vogele, Peter, 4,051,059, Cl. 252-186.000.

Vogelfanger, Elliot A.: *See—*
Kirshenbaum, Gerald S.; and Vogelfanger, Elliot A., 4,051,265, Cl. 426-107.000.

Vogelpohl, Roland L.: *See—*
Tom, Elgin Megginson; and Vogelpohl, Roland L., 4,050,602, Cl. 220-2.10A.

Vogt, B. Richard; and Cullison, David A., to E. R. Squibb & Sons, Inc. 1,3,8-Triazaspiro(4.5)decan-4-one derivatives. 4,051,248, Cl. 424-267.000.

Vogt, Berthold Richard: *See—*
Wade, Peter C.; and Vogt, Berthold Richard, 4,051,246, Cl. 424-258.000.

Volk, David. Apparatus for farming ophthalmic lens for presbyopia and aphakia. 4,050,192, Cl. 51-33.00R.

Volk, John A.: *See—*
Dukich, Peter P.; Metzger, Isaac W.; and Volk, John A., 4,051,534, Cl. 358-210.000.

Volkswagenwerk Aktiengesellschaft: *See—*
Hablitzel, Hermann, 4,050,726, Cl. 293-71.00R.

Vollmar, Ronald D. Process for raising manholes. 4,050,839, Cl. 404-72.000.

Von Roll AG: *See—*
Luchsinger, Peter; Muckenheim, Heribert; Riemann, Hanns-Helmut; Sonnenschein, Hans; and Michel, Erich, 4,050,387, Cl. 110-8.00A.

von Allworden, Wilhelm, to Jean Walterscheid GmbH. Coupling hook for a guide member of a three-point attachment of a tractor. 4,050,715, Cl. 280-508.000.

von der Crone, Jost, to Ciba-Geigy Corporation. Process for the dyeing of thermoplastics in the melt. 4,051,099, Cl. 260-40.00P.

von Dreusche, Charles F., Jr., to Nichols Engineering & Research Corporation. Method and apparatus for incinerating waste material. 4,050,389, Cl. 110-12.000.

von Fischern, Bernhard: *See—*
Wagensonner, Eduard; Huber, Theodor; and von Fischern, Bernhard, 4,050,795, Cl. 352-141.000.

von Orelli, Marcus: *See—*
Durr, Dieter; and von Orelli, Marcus, 4,051,258, Cl. 424-322.000.

Voogd, Roeland H.: *See—*
Pannekeet, Wilhelmus; Steenken, Gerhard E. W. K.; and Voogd, Roeland H., 4,051,221, Cl. 423-54.000.

Vora, Chandrakant Ratilal: *See—*
Lawrie, Duncan H.; and Vora, Chandrakant Ratilal, 4,051,551, Cl. 364-200.000.

Vork, William Duncan, to Graco Inc. Diaphragm pump having a reed valve barrier to hydraulic shock in the pressurizing fluid. 4,050,859, Cl. 417-386.000.

Vostovich, Joseph Edward: *See—*
Misiura, Thaddeus Dominick; Vostovich, Joseph Edward; and Wahl, Ralph Edward, 4,051,298, Cl. 428-383.000.

Voznick, Henry P.: *See—*
Junkert, Kenneth G.; and Voznick, Henry P., 4,050,309, Cl. 73-362.0AR.

Vyatskin, Iosif Yakovlevich, deceased: *See—*
Lavrentiev, Konstantin Nikitich; Borisova, Natalya Isaakievna; Vasiliev, Jury Ivanovich; Rodionov, Jury Nikolaevich; Strashinsky, Vadim Konstantinovich; Ioffe, Vladimir Fedorovich; and Vyatskin, Iosif Yakovlevich, deceased, 4,051,422, Cl. 318-570.000.

Vyatskina, Itta Moiseevna, administrator: *See—*
Lavrentiev, Konstantin Nikitich; Borisova, Natalya Isaakievna; Vasiliev, Jury Ivanovich; Rodionov, Jury Nikolaevich; Strashinsky, Vadim Konstantinovich; Ioffe, Vladimir Fedorovich; and Vyatskin, Iosif Yakovlevich, deceased, 4,051,422, Cl. 318-570.000.

Vyzkumny ustav bavlnarsky: *See—*
Brozkova, Marie; Burysek, Frantisek; Janousek, Jan; Mikulecky, Karel; and Skoda, Stanislav, 4,050,226, Cl. 57-34.00R.

W. A. Krueger Co.: *See—*
Dunlap, Clifford E., 4,050,591, Cl. 214-6.00D.

W. H. Dickinson Engineering Limited: *See—*
Dickinson, William H. C., 4,050,741, Cl. 302-13.000.

W. L. Gore & Associates, Inc.: *See—*
Miyauchi, Terukatsu; and Furusaki, Shintaro, 4,051,011, Cl. 204-299.00R.
Miyauchi, Terukatsu, 4,051,230, Cl. 423-658.500.

WABCO Westinghouse GmbH: *See—*
Ruhnau, Gerhard; Gudat, Wolfgang; Liermann, Peter; and Hesse, Karl-Heinz, 4,050,747, Cl. 303-95.000.

Wacker-Chemie GmbH: *See—*
Leiser, Manfred; Wegehaupt, Karl-Heinrich; and Marsch, Wilhelm, 4,051,454, Cl. 338-328.000.

Wada, Toshihiko: *See*—
Ohtsuka, Shigeto; Ueno, Saburo; Yoshikumi, Chikao; Hirose, Fumio; Ohmura, Yoshio; Wada, Toshihiko; Fujii, Takayoshi; and Takahashi, Eiichi, 4,051,314, Cl. 536-1.000.

Wade, Elman E., to Westinghouse Electric Corporation. Rotating plug bearing and seal. 4,050,987, Cl. 176-87.000.

Wade, Peter C.; and Vogt, Berthold Richard, to E. R. Squibb & Sons, Inc. 2-Substituted-1H-benz(de)-isoquinoline-1,3-(2H)-diones. 4,051,246, Cl. 424-258.000.

Wadleigh, Edward R. Synchronated index film drive mechanism. 4,050,650, Cl. 242-206.000.

Waer, Richard R.: *See*—
Albanese, Damian F.; and Waer, Richard R., 4,051,472, Cl. 343-5.0PD.

Wagenhals, Bruce E.: *See*—
Kemper, James M.; O'Neill, Robert J.; Wagenhals, Bruce E.; and Adams, Jack W., 4,050,102, Cl. 4-10.000.

Wagensonner, Eduard; Huber, Theodor; and von Fischern, Bernhard, to Agfa-Gevaert Aktiengesellschaft. Motion picture camera operable by a single operating switch. 4,050,795, Cl. 352-141.000.

Wagner, Hans Peter: *See*—
Stoller, Hansjorg; and Wagner, Hans Peter, 4,051,174, Cl. 560-234.000.

Wagner, Kuno; and Klinkmann, Kurt, to Bayer Aktiengesellschaft. Preparation of biuret polyisocyanates. 4,051,165, Cl. 260-453.0AB.

Wahl, Ralph Edward: *See*—
Misiura, Thaddeus Dominick; Vostovich, Joseph Edward; and Wahl, Ralph Edward, 4,051,298, Cl. 428-383.000.

Wahman, Lorentz. Coupling device for joining together reinforced concrete elements, such as concrete piles or pillars. 4,050,211, Cl. 52-726.000.

Wakana, Hiroshi; Harada, Isamu; and Honma, Tsutomu, to Bridgestone Tire Company Limited. Panel assembled tank. 4,050,605, Cl. 220-5.00A.

Waldby, Robert N.: *See*—
Ference, Edward W.; Houtman, John L.; and Waldby, Robert N., 4,050,986, Cl. 176-61.000.

Walden, Robert Henry: *See*—
Krambeck, Robert Harold; Sequin, Carlo Heinrich; and Walden, Robert Henry, 4,051,505, Cl. 357-24.000.

Walker, Francis H.: *See*—
Arneklev, Duane R.; Baker, Don R.; and Walker, Francis H., 4,051,184, Cl. 260-559.00B.
Baker, Don R.; and Walker, Francis H., 4,050,923, Cl. 71-118.000.

Wallace Business Forms, Inc.: *See*—
Kalve, Uldis H., 4,050,582, Cl. 206-627.000.

Wallenberger, Frederick Theodore, to Du Pont de Nemours, E. I., and Company. Process for comolding a composite cushioning structure from a pneumacel fiber batt and synthetic elastomeric foam. 4,051,210, Cl. 264-45.400.

Walt Disney Productions: *See*—
Gurr, Robert H.; and Broggie, Roger E., 4,050,385, Cl. 104-173.0ST.

Walter, Harald: *See*—
Gantke, Franz; Walter, Harald; and Zywietz, Walter, 4,050,212, Cl. 52-726.000.

Walther, Ronald Gene: *See*—
Eichelberger, Edward Baxter; Muehldorf, Eugene Igor; Walther, Ronald Gene; and Williams, Thomas Walter, 4,051,352, Cl. 364-716.000.

Wang, Patricia C.; and Wingard, Robert E., to Dynapol. Water-soluble amine-linked polymeric colorants. 4,051,138, Cl. 260-278.000.

Wankel GmbH: *See*—
Wieland, Werner, 4,050,132, Cl. 29-156.40R.

Wanner, Karl: *See*—
Reibetanz, Wilbert; Wanner, Karl; and Hahner, Reinhard, 4,050,345, Cl. 85-68.000.

Warble, Charles Edward: *See*—
de Bruin, Henderikus Johannes; and Warble, Charles Edward, 4,050,956, Cl. 148-6.000.

Ward, Arthur Gerard: *See*—
Buck, George Sumner, Jr.; Weyker, Robert George; and Ward, Arthur Gerard, 4,050,977, Cl. 156-283.000.
Buck, George Sumner, Jr.; Weyker, Robert George; and Ward, Arthur Gerard, 4,051,294, Cl. 428-283.000.

Ward, Denby Harcourt: *See*—
Lawson, Frank; Waverley, Glen; Ward, Denby Harcourt; and Kelly, Robert George, 4,050,926, Cl. 75-78.000.

Ward, Dennis J., to UOP Inc. Solid phosphoric acid catalyzed alkylation of aromatic hydrocarbons. 4,051,191, Cl. 260-671.00R.

Warner, Ronald E.; Healey, Francis J.; and Grijalba, Abel D., to Westinghouse Electric Corporation. Method for removing rotatable blades without removing the casting of a turbine. 4,050,134, Cl. 29-156.80R.

Warrin, George E., to Cavitron Corporation. Dental handpiece switch. 4,051,337, Cl. 200-61.850.

Wasem, Hans: *See*—
Tcherkinsky, Boris; and Wasem, Hans, 4,051,121, Cl. 260-174.000.

Watanabe, Akinori; Tanoshima, Katsuhide; Noguchi, Matsusaburo; and Hattori, Kinya, to Oki Electric Industry Company, Ltd. High speed printer with heated aperture board. 4,050,377, Cl. 101-114.000.

Watanabe, Hideaki: *See*—
Tanaka, Satoru; and Watanabe, Hideaki, 4,051,125, Cl. 260-239.0BC.

Watanabe, Ietatsu, to Tomy Kogyo Co., Inc. Coin toy. 4,050,183, Cl. 46-4.000.

Watanabe, Sataya, to Nippon Kogaku K.K. Filter holder insertable into the lens barrel of a camera. 4,050,791, Cl. 350-318.000.

Watanabe, Takao, to Hitachi, Ltd. Control system for steam generator. 4,050,418, Cl. 122-451.00R.

Watson, James J., Jr., to Carrier Corporation. Remote heating process. 4,050,881, Cl. 432-5.000.

Watson, Richard D.; and Sowash, Thomas R., to General Motors Corporation. Threaded terminal assembly for dynamoelectric machine. 4,050,771, Cl. 339-263.00R.

Watt, Roy E.: *See*—
Brucken, Byron L.; and Watt, Roy E., 4,050,852, Cl. 417-273.000.

Watts, Horace, to H. & D. E. Watts Limited. Mixing faucet. 4,050,475, Cl. 137-625.170.

Waverley, Glen: *See*—
Lawson, Frank; Waverley, Glen; Ward, Denby Harcourt; and Kelly, Robert George, 4,050,926, Cl. 75-78.000.

Waxman, Albert S., to Princeton Electronic Products, Inc. Electronic storage tube target having a radiation insensitive layer. 4,051,406, Cl. 313-391.000.

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Whitcomb, Paul H., to Eaton Yale Ltd. Apparatus for delimbing trees. 4,050,486, Cl. 144-2.00Z.

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Wilson, William. Process container. 4,050,580, Cl. 206-511.000.

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NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

DeCraene, Denis F., to Diamond Shamrock Technologies S.A. Finely divided RuO_2/plastic matrix. Re. 29,419, Cl. 204-290.00F.

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Hekkanen, Eero M.; and Tokola, Alpo J., to Kaiser Steel Corporation. Method and apparatus for fabricating an off-shore structure. Re. 29,413, Cl. 61-96.000.

Hunt, Robert F., to International Paper Company. Flexible ceramic member having a pre-loaded tensile force applying means. Re. 29,418, Cl. 162-274.000.

Hunt, Robert F.: *See*—
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International Harvester Company: *See*—
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International Paper Company: *See*—
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Jonsson, Bo Folke: *See*—
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Kaiser Steel Corporation: *See*—
Hekkanen, Eero M.; and Tokola, Alpo J., Re. 29,413, Cl. 61-96.000.

Lee, Charles A.; and Hunt, Robert F., to International Paper Company. Papermaking system including a flexible ceramic member having a pre-loaded tensile force applying means. Re. 29,417, Cl. 162-274.000.

Lindstrom, Jan Nils; Jonsson, Bo Folke; and Ohlsson, Fall Johan Olof William, to Sandvik Aktiebolag. Sintered cemented carbide body coated with two layers. Re. 29,420, Cl. 428-336.000.

Ohlsson, Fall Johan Olof William: *See*—
Lindstrom, Jan Nils; Jonsson, Bo Folke; and Ohlsson, Fall Johan Olof William, Re. 29,420, Cl. 428-336.000.

Peille, Jean-Marie Raymond, to Societe Industrielle de Stratifies. Equipment for the continuous production of panels of synthetic material. Re. 29,416, Cl. 425-115.000.

Prokop, Josef F., to International Harvester Company. Shift mechanism for mechanical transmissions. Re. 29,414, Cl. 74-477.000.

Ricobene, Sam; and Dunn, Lyman D. Food container assembly. Re. 29,415, Cl. 206-550.000.

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Scott, Warner C., to Texas Instruments Incorporated. Laser system having electronically selectable gain. Re. 29,421, Cl. 331-94.50Q.

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261 4,050,279
265 4,050,281
286 4,050,282
344 4,050,283
384 4,050,284
391 4,050,285
416 4,050,286
457 4,050,287
468 4,050,288

CLASS 73

1 F 4,050,289
9 4,050,290
38 4,050,291
67.5 R 4,050,292
105 4,050,293
4,050,294
114 4,050,295
116 4,050,296
117.2 4,050,297
121 4,050,298
126 4,050,299
139 4,050,300
189 4,050,301
190 H 4,050,302
194 B 4,050,304
194 EM 4,050,303
209 4,050,305
212 4,050,306
337 4,050,307
362 AR 4,050,308
4,050,309
379 4,050,310
389 4,050,311
395 4,050,312
398 AR 4,050,313
406 4,050,314
425.4 R 4,050,315
425.6 4,050,316

CLASS 74

64 4,050,317
89.15 4,050,318
4,050,319
112 4,050,320
230.8 4,050,321
231 J 4,050,322
251 C 4,050,323
397 4,050,324
473 R 4,050,325
477 Re.29,414
492 4,050,326
502 4,050,327
711 4,050,328
750 R 4,050,329
759 4,050,330
804 4,050,331
869 4,050,332

CLASS 75

5 4,050,924
30 4,050,925
78 4,050,926
122 4,050,927
124 4,050,928
171 4,050,929
173 A 4,050,930
175.5 4,050,931
211 4,050,932
246 4,050,933

CLASS 76

112 4,050,333

CLASS 81

119 4,050,334

CLASS 82

4 C 4,050,335

CLASS 83

486.1 4,050,336
552 4,050,337
641 4,050,338
703 4,050,339
743 4,050,340

CLASS 84

1.01 4,050,343
1.15 4,050,341
95 C 4,050,342

CLASS 85

68 4,050,344
4,050,345
69 4,050,346

CLASS 86

20 R 4,050,347

CLASS 89

1.701 4,050,351
7 4,050,348
4,050,349
4,050,352

CLASS 90

1.6 R 4,050,350
5 4,050,353
13 C 4,050,354
56 R 4,050,355

CLASS 91

306 4,050,356
410 4,050,357

CLASS 92

103 F 4,050,358
113 4,050,359
127 4,050,360

CLASS 93

1 F 4,050,361
58 R 4,050,362

CLASS 96

1 PC 4,050,935
1 R 4,050,934
28 4,050,936
48 R 4,050,937
84 R 4,050,938
88 4,050,939
114.5 4,050,940
115 P 4,050,941
115 R 4,050,942

CLASS 98

37 4,050,363
4,050,364
40 C 4,050,365
110 4,050,366
115 LH 4,050,367
4,050,368

CLASS 99

463 4,050,369
538 4,050,370
550 4,050,371

CLASS 100

2 4,050,372
240 4,050,373

CLASS 101

91 4,050,374
110 4,050,375
111 4,050,376
114 4,050,377
147 4,050,378
327 4,050,379
349 4,050,383
365 4,050,380

CLASS 102

4 4,050,381

16 4,050,382

CLASS 104

138 G 4,050,384
173 ST 4,050,385

CLASS 106

12 4,050,943
19 4,050,944
21 4,050,945
39.6 4,050,946
52 4,050,947
76 4,050,948
97 4,050,949
4,050,950
300 4,050,951

CLASS 108

111 4,050,386

CLASS 110

8 A 4,050,387
8 P 4,050,388
12 4,050,389
15 4,050,390

CLASS 112

77 4,050,391
113 4,050,392
121.12 4,050,393

CLASS 113

120 R 4,050,394

CLASS 114

77 R 4,050,395
183 R 4,050,396
274 4,050,397

CLASS 115

18 R 4,050,398
71 4,050,399

CLASS 116

26 4,050,400
63 P 4,050,401
86 4,050,402
124 R 4,050,403
4,050,404
142 FP 4,050,405

CLASS 118

19 4,050,406
49.1 4,050,408
58 4,050,407
406 4,050,409
410 4,050,410
625 4,050,411
642 4,050,412
647 4,050,413

CLASS 119

1 4,050,414
51.5 4,050,415
97 R 4,050,416
156 4,050,417

CLASS 122

451 R 4,050,418

CLASS 123

3 4,050,419
30 C 4,050,420
41.72 4,050,421
75 B 4,050,422
117 A 4,050,423
119 A 4,050,429
119 E 4,050,426
119 EC 4,050,425
4,050,428
119 F 4,050,424
4,050,427
122 D 4,050,430
139 AC 4,050,437
139 AQ 4,050,432
4,050,433
139 AW 4,050,431
140 FG 4,050,434
198 DB 4,050,436
198 F 4,050,435

CLASS 124

20 R 4,050,438
4,050,439

CLASS 126

120 4,050,440
121 4,050,441
213 4,050,442
270 4,050,443
271 4,050,444
4,050,445
299 E 4,050,446
374 4,050,447

CLASS 127

46 R 4,050,952
60 4,050,953

CLASS 128

1 R 4,050,448
2 F 4,050,451
2 L 4,050,450
2 S 4,050,449
2.05 A 4,050,452
2.06 E 4,050,453
70 4,050,454
80 F 4,050,455
88 4,050,456
145.5 4,050,457
145.8 4,050,458
218 C 4,050,459
223 4,050,460
227 4,050,461
287 4,050,462
4,050,463
303 R 4,050,464
326 4,050,465
351 4,050,466

CLASS 131

147 A 4,050,467
232 4,050,468

CLASS 132

11 R 4,050,469
89 4,050,470

CLASS 134

2 4,050,954
8 4,050,955

CLASS 137

39 4,050,471
242 4,050,472
244 4,050,473
596 4,050,474
625.17 4,050,475
625.62 4,050,476
625.65 4,050,477
625.66 4,050,478

CLASS 138

42 4,050,479

CLASS 139

55.1 4,050,480
436 4,050,481

CLASS 141

1.1 4,050,482
4 4,050,483
34 4,050,484

CLASS 144

2 Z 4,050,485
4,050,486
28.5 4,050,487
309 AC 4,050,488
315 R 4,050,489
316 4,050,490

CLASS 148

6 4,050,956
6.3 4,050,957
9.5 4,050,958
12.3 4,050,959
16 4,050,960
32 4,050,961
105 4,050,962
128 4,050,963
171 4,050,964
175 4,050,965
188 4,050,966
189 4,050,967

CLASS 149

19.4 4,050,968
4,050,969
88 4,050,970

CLASS 150

1.6 4,050,491
4 4,050,492
35 4,050,493

CLASS 151

49 4,050,494

CLASS 152

187 4,050,495
241 4,050,496
361 FP 4,050,497

CLASS 156

69 4,050,971
71 4,050,972
123 R 4,050,973
159 4,050,974
217 4,050,975
233 4,050,976
283 4,050,977
300 4,050,978
647 4,050,979

CLASS 160

374.1 4,050,498

CLASS 162

24 4,050,980
37 4,050,981
100 4,050,982
274 Re.29,417
Re.29,418
317 4,050,499

CLASS 164

16 4,050,500
68 4,050,501
4,050,502
155 4,050,503
201 4,050,504
206 4,050,505

CLASS 165

1 4,050,506
4,050,507
32 4,050,508
45 4,050,509
89 4,050,510
162 4,050,511

CLASS 166

128 4,050,512
176 4,050,514
274 4,050,513
303 4,050,515
305 R 4,050,516
315 4,050,517

CLASS 171

116 4,050,518

CLASS 172

49 4,050,519
59 4,050,520
196 4,050,521
311 4,050,522
4,050,523
707 4,050,524

CLASS 173

17 4,050,525
27 4,050,526
49 4,050,527
163 4,050,528

CLASS 174

57 4,051,321
65 R 4,051,322
78 4,051,323
121 R 4,051,324

CLASS 175

422 4,050,529

CLASS 176

38 4,050,983
60 4,050,984
61 4,050,985
4,050,986
87 4,050,987
4,050,988

CLASS 177

1 4,050,530
198 4,050,531
211 4,050,532

CLASS 179

1 HF 4,051,325
2 DP 4,051,326
5 R 4,051,327
15 AL 4,051,328
100.3 N 4,051,329
107 FD 4,051,330
107 R 4,051,331
170.2 4,051,332
175.3 R 4,051,333

CLASS 180

6.5 4,050,533
24.09 4,050,534
51 4,050,535
66 B 4,050,536
91 4,050,537

CLASS 181

114 4,050,540
159 4,050,541
210 4,050,538
280 4,050,539

CLASS 182

10 4,050,542

CLASS 184

6.3 4,050,543
6.6 4,050,544

CLASS 187

8.43 4,050,545
12 4,050,546
29 R 4,050,547

CLASS 188

71.8 4,050,548
72.8 4,050,549
112 4,050,550
181 C 4,050,551
195 4,050,552
203 4,050,553
4,050,554

CLASS 191

23 A 4,050,555

CLASS 192

4 B 4,050,556
4 R 4,050,557
53 G 4,050,558
58 B 4,050,559
85 AT 4,050,560

CLASS 193

35 R 4,050,561

CLASS 194

4 E 4,050,562

CLASS 195

29 4,050,989

CLASS 197

1 R 4,050,563
4,050,564
6.3 4,050,565
19 4,050,566
72 4,050,567
90 4,050,568
120 4,050,569

CLASS 198

347 4,050,572
366 4,050,573
398 4,050,570
458 4,050,574
774 4,050,571
834 4,050,575

CLASS 200

50 AA 4,051,334
4,051,335
61.43 4,051,336
61.85 4,051,337
85 R 4,051,338
153 L 4,051,339
329 4,051,340

CLASS 201

5 4,050,990

CLASS 202

99 4,050,991
227 4,050,992

CLASS 203

9 4,050,993
35 4,050,994

CLASS 204

1 T 4,050,995
28 4,050,996
4,050,997
59 R 4,050,998
67 4,050,999
106 4,051,000
151 4,051,001
157.1 R 4,051,005
159.17 4,051,003
180 P 4,051,002
181 4,051,004
195 P 4,051,006
197 4,051,007
266 4,051,008
279 4,051,009
290 F Re.29,419
298 4,051,010
299 R 4,051,011

CLASS 206

210 4,050,576
322 4,050,577
340 4,050,578
460 4,050,579
511 4,050,580
544 4,050,581
550 Re.29,415
627 4,050,582

CLASS 208

8 4,051,012
78 4,051,013
88 4,051,014
108 4,051,015
127 4,051,016
135 4,051,017
139 4,051,018
146 4,051,019
213 4,051,020
216 4,051,021
253 4,051,022

CLASS 209

223 A 4,051,023

CLASS 210

30 A 4,051,024
31 C 4,051,025
38 B 4,051,026
42 R 4,051,027
47 4,051,028
58 4,051,029
114 4,051,030
133 4,051,031
142 4,051,032
193 4,051,033
206 4,051,034
220 4,051,035
232 4,051,036
236 4,051,037
242 S 4,051,038
274 4,051,039
321 B 4,051,040
4,051,041
409 4,051,042

CLASS 211

20 4,050,583
76 4,050,584

CLASS 212

48 4,050,585
59 R 4,050,586
4,050,587

CLASS 213

75 B 4,050,588

CLASS 214

1 PA 4,050,589
2.5 4,050,590
6 D 4,050,591
18.2 4,050,592
44 C 4,050,593
83.3 4,050,594
84 4,050,595
131 A 4,050,596
331 4,050,597
518 4,050,598
730 4,050,599

CLASS 215

11 R 4,050,600

CLASS 219

10.55 D 4,051,341
60 A 4,051,342
84 4,051,343
132 4,051,344
288 4,051,345
328 4,051,346
400 4,051,347
506 4,051,348

CLASS 220

2.1 A 4,050,601
4,050,602
3.9 4,050,603
4 F 4,050,604
5 A 4,050,605
7 4,050,606
9 LG 4,050,607
4,050,608
4,050,609

CLASS 221

171 4,050,610

CLASS 222

88 4,050,611
135 4,050,612
321 4,050,613

CLASS 224

29 R 4,050,614
32 A 4,050,615
42.03 B 4,050,616

CLASS 226

1 4,050,617

CLASS 228

6 A 4,050,618
162 4,050,619
4,050,620
180 R 4,050,621

CLASS 229

19 4,050,622
23 R 4,050,623
33 4,050,624
38 4,050,625

CLASS 238

130 R 4,051,349
302.3 4,051,355
310 4,051,356
312 4,051,354

CLASS 237

1 A 4,050,626
55 4,050,627
4,050,628

CLASS 239

11 4,050,629
121 4,050,630
265.25 4,050,631
425 4,050,632
550 4,050,633
601 4,050,634

CLASS 241

24 4,050,635
46 B 4,050,636
56 4,050,637
222 4,050,638

CLASS 242

18 G 4,050,639
25 R 4,050,640
47 4,050,641
55 4,050,642
72 R 4,050,643
107.4 A 4,050,644
125.1 4,050,645
4,050,646
129.8 4,050,647
4,050,648
130.1 4,050,649
206 4,050,650

CLASS 244

15 4,050,651
23 C 4,050,652
32 4,050,653
49 4,050,654
137 R 4,050,655
4,050,656
139 4,050,657

CLASS 248

13 4,050,658
19 4,050,659
4,050,660
285 4,050,661
291 4,050,662
316 A 4,050,663
346 4,050,664
358 R 4,050,665

CLASS 249

68 4,050,666
82 4,050,667
106 4,050,668

CLASS 250

199 4,051,363
4,051,364
222 R 4,051,365
223 B 4,051,366
237 G 4,051,367
270 4,051,368
321 4,051,369
331 4,051,370
339 4,051,371
343 4,051,372
363 S 4,051,373
370 4,051,374
372 4,051,375
381 4,051,376
401 4,051,377
421 4,051,378
445 T 4,051,379
451 4,051,380
492 A 4,051,381
531 4,051,043
4,051,044
4,051,382
536 4,051,045

CLASS 251

5 4,050,669
14 4,050,670

CLASS 252

8.6 4,051,046
33 4,051,047
51.5 A 4,051,049
51.5 R 4,051,048
4,051,050
59 4,051,051
62.1 L 4,051,052
62.1 P 4,051,077
78.3 4,051,053
89 R 4,051,054
95 4,051,055
99 4,051,056
100 4,051,057
186 4,051,058
4,051,059
301.1 W 4,051,063
301.17 4,051,062
309 4,051,064
359 A 4,051,065
389 R 4,051,066
401 4,051,067
412 4,051,068
417 4,051,069
428 4,051,070
439 4,051,071
464 4,051,072
466 PT 4,051,073
503 4,051,074
511 4,051,075
522 4,051,076

CLASS 254

7 R 4,050,671
10 R 4,050,672
89 H 4,050,673
93 H 4,050,674
104 4,050,675

CLASS 260

2 A 4,051,078
2.2 R 4,051,079
2.3 4,051,080
2.5 AD 4,051,081
2.5 AR 4,051,082
5 4,051,083
16 4,051,085
17.4 GC 4,051,086
18 N 4,051,087
20 4,051,088
22 R 4,051,089
23.7 M 4,051,090
29.2 TN 4,051,091
29.3 4,051,092
29.6 M 4,051,094
29.6 TA 4,051,093
31.8 DR 4,051,095
31.8 M 4,051,096
38 4,051,097
4,051,098
40 P 4,051,099
42.18 4,051,100
45.75 W 4,051,103
45.8 N 4,051,102
45.85 B 4,051,104
45.85 R 4,051,101
45.95 G 4,051,105
47 C 4,051,106
4,051,107
47 CP 4,051,108
49 4,051,109
72 R 4,051,110
75 NP 4,051,111
75 T 4,051,112
78 L 4,051,113
123.5 4,051,114
124 R 4,051,115
145 A 4,051,116
146 R 4,051,117
153 4,051,118
156 4,051,119
158 4,051,084
4,051,120
174 4,051,121
4,051,122
178 4,051,123
192 4,051,124
239 BC 4,051,125
239.1 4,051,126
239.3 D 4,051,127
239.57 4,051,128
268 R 4,051,136
268 TR 4,051,137
278 4,051,138
290 HL 4,051,139
290 P 4,051,140
294.8 C 4,051,141
294.9 4,051,142
295.5 R 4,051,143
307 FA 4,051,144
314.5 4,051,146
326.47 4,051,147
327 B 4,051,148
4,051,149
4,051,150
329 S 4,051,151
345.3 4,051,152
345.5 4,051,153
346.22 4,051,154
379 4,051,155
393 4,051,156
397.1 4,051,157
404.5 4,051,158
4,051,159
413 4,051,160

448.2 N 4,051,163
448.8 R 4,051,161
4,051,164
453 AB 4,051,165
453 AR 4,051,166
453 RZ 4,051,167
456 R 4,051,168
502.5 4,051,175
506 4,051,176
510 4,051,177
524 R 4,051,178
530 N 4,051,179
4,051,180
531 R 4,051,181
544 Y 4,051,182
553 A 4,051,183
559 B 4,051,184
561 R 4,051,185
570.7 4,051,186
575 4,051,187
590 FA 4,051,188
619 A 4,051,189
651 R 4,051,190
671 R 4,051,191
674 SA 4,051,192
683.3 4,051,193
836 4,051,194
837 R 4,051,195
857 PG 4,051,196
876 B 4,051,197
879 4,051,198
880 R 4,051,199
899 4,051,200
930 4,051,201
990 4,051,202
4,051,203

CLASS 261

36 R 4,051,204
70 4,051,205
109 4,051,206

CLASS 264

3 B 4,051,207
5 4,051,208
39 4,051,209
45.4 4,051,210
51 4,051,211
102 4,051,212
109 4,051,213
137 4,051,214
4,051,215
157 4,051,216
230 4,051,217
248 4,051,218

CLASS 266

44 4,050,679
48 4,050,680
82 4,050,681
158 4,050,682
164 4,050,683

CLASS 267

65 R 4,050,684

CLASS 269

296 4,050,685

CLASS 270

54 4,050,686

CLASS 271

3.1 4,050,687
5 4,050,688
124 4,050,691
125 4,050,690
267 4,050,692

CLASS 272

78 4,050,693

CLASS 273

26 E 4,050,694
53 4,050,695
106.5 B 4,050,696
139 4,050,697
152.41 4,050,698

CLASS 274

15 A 4,050,699

CLASS 277

72 FM 4,050,700
125 4,050,701
148 4,050,702
207 A 4,050,703

CLASS 280

6 R 4,050,704
11.1 BT 4,050,705
12 R 4,050,706
43.23 4,050,707
47.26 4,050,708
106 T 4,050,709
112 A 4,050,710
278 4,050,711
4,050,712
4,050,713
495 4,050,714
508 4,050,715
614 4,050,716
744 4,050,717
763 4,050,718

CLASS 283

36 4,050,719

CLASS 285

18 4,050,720
93 4,050,721
175 4,050,722

CLASS 292

164 4,050,723
241 4,050,724
304 4,050,725

CLASS 293

71 P 4,050,689
71 R 4,050,726

CLASS 294

49 4,050,727
58 4,050,728
64 R 4,050,729
82 R 4,050,730
86.24 4,050,731

CLASS 296

23 A 4,050,732
28 C 4,050,733
98 4,050,734
102 4,050,735

CLASS 297

135 4,050,736
389 4,050,737
452 4,050,738

CLASS 298

19 V 4,050,739

CLASS 299

6 4,050,740

CLASS 302

13 4,050,741
66 4,050,742

CLASS 303

22 R 4,050,743
24 A 4,050,744
36 4,050,745
40 4,050,746
95 4,050,747
114 4,050,748
119 4,050,749

CLASS 305

54 4,050,750

CLASS 307

11 4,051,383
18 4,051,384
233 R 4,051,385
271 4,051,386
273 4,051,387
279 4,051,388
291 4,051,389
293 4,051,390
297 4,051,391
4,051,392
306 4,051,393
310 4,051,394

CLASS 310

12 4,051,398
51 4,051,399
58 4,051,400
216 4,051,401
266 4,051,402
329 4,051,395
340 4,051,396
351 4,051,397

CLASS 312

197 4,050,751
243 4,050,752
257 SK 4,050,753
319 4,050,754

CLASS 313

105 CM 4,051,403
220 4,051,404
361 4,051,405
391 4,051,406

CLASS 315

106 4,051,407
169 R 4,051,408
169 TV 4,051,409
205 4,051,410
4,051,411
4,051,412
219 4,051,413

CLASS 318

7 4,051,415
85 4,051,416
138 4,051,417
227 4,051,418
4,051,419
254 4,051,420
367 4,051,421
570 4,051,422
611 4,051,423

CLASS 320

48 4,051,424

CLASS 322

99 4,051,427

CLASS 323

4 4,051,428

CLASS 324

.5 A 4,051,429
34 TK 4,051,430
61 R 4,051,431
72.5 4,051,432
78 D 4,051,434
78 R 4,051,433
95 4,051,435
102 4,051,436
158 R 4,051,437

CLASS 325

45 4,051,438
121 4,051,439

CLASS 328

134 4,051,440

CLASS 330

68 4,051,444
258 4,051,443
281 4,051,442
288 4,051,441

CLASS 331

94.5 Q Re.29,421
113 A 4,051,445
116 R 4,051,446

CLASS 333

24 R 4,051,447
30 R 4,051,448
73 C 4,051,449
95 R 4,051,450

CLASS 338

42 4,051,451
51 4,051,452
171 4,051,453
328 4,051,454

CLASS 339

17 CF 4,050,755
59 M 4,050,756
59 R 4,050,757
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220 R 4,050,772
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18 LD 4,051,456
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6 :	4,113	4,114	4,115	4,116	39 :	4,111	41 :	4,112

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